

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[PRICE 6D.]

COWARD & RICHARDS and ANOTHER.

Dated the 12th day of March.

RICHARDS v. KITTO, *Jan.*

Dated the 24 day of March.

1. *Journal of the American Medical Association*, 1997; 278: 1039-1044.

LAW INTELLIGENCE.

HOT-BLAST—NEILSON'S PATENT.

[In addition to the information published in our last, we have been requested to insert the answers, and with which we readily comply, to the questions which all persons connected with this important case should be placed before our readers.]

THE HOUSEHOLD COAL AND IRON COMPANY AND OTHERS—Appellants.
JAMES BRADMORE NEILSON AND OTHERS—Respondents.

The Lord Chancellor: My lords, the principal question in this case arises out of the eleventh exception. The learned judge (who presided on the trial in the jury court) stated to the jury what he considered to be sufficient evidence to support prior use as to the patent. The learned judge expressed himself in these terms:—He says "You will observe that it is settled that the trial founded on as a proof of prior use must have been public—must have been continued, not abandoned—must have continued to the time when the patent was granted—I do not say to the very exact period, but it must have been known and used as a useful thing at the time." (After some observations on the meaning of the word "trials" as used by the presiding judge in the jury court, the Lord Chancellor continued)—I understand the proposition of the learned judge to be this—that if the machine had been made, and had been put in trial, unless those trials had gone on, and the machine had been used up to the time of the granting of the letters patent, it would not be evidence of prior use as to the patent. Now, my lords, with all deference to the learned judge, and with all respect to the learned judges of the Court of Session, that I think in that respect they are mistaken, and that if it is proved distinctly that a machine of the same kind was in existence, and was in public use; that is, if use, or if trials, had been made of it in the eye, and in the presence of the public, it is not necessary that it should come down to the time when the patent was granted. If it was discontinued, still that is sufficient evidence in support of the prior use as to the patent. If it is discontinued, provided it has been once in public use, and the recollection of it has not been altogether lost—if it has been once publicly used, it will be sufficient to invalidate the letters patent, although the use may be discontinued at the time when the letters patent were granted. Now, my lords, I apprehend that that is the law, and the known law, upon the subject in this country. I never heard it before questioned that the notorious public use of the invention before the granting of letters patent, though it may have been discontinued, is sufficient to invalidate the letters patent. Then, my lords, the remaining question for consideration is this, and it is an important one, whether, if the learned judge laid down the law incorrectly in the jury, this was calculated to mislead the jury? (His lordship then explains how it was calculated to mislead, and says)—Therefore, it is perfectly obvious, that, if the learned judge be incorrect in the manner in which he stated the law, in the particular in which I have stated, it was calculated to mislead the jury. Under these circumstances, my lords, I should recommend your lordships to allow the eleventh exception, and to disallow all the rest.

Lord Brougham: My lords, I entirely agree in the view taken, and for the reason so luminously expressed by my noble and learned friend on the woolsack, that the exceptions, all but the eleventh, were properly disallowed by the court before whom the bill was brought, and that your lordship should disallow these exceptions here, affirming the judgment below; but I also entirely agree with my noble and learned friend, that we have no choice here but to allow the eleventh exception. If we are of opinion, first, that the law has been mistaken, and under a misapprehension of it, it has been erroneously delivered by the judge in the jury; and if we are, secondly, of opinion that the misdirection in point of law, the mistake in point of law, committed by the learned judge, had a direct tendency, I may almost say an inevitable tendency, to mislead the jury in the conclusion to which they should come, and in the verdict which they should deliver; then, my lords, both of these questions being answered in the affirmative, that the law was mistaken, and that the mistake tended to mislead the jury in their verdict, we have no choice, but must allow the exception. Now, my lords, a more important mistake in point of law, your lordships will give me leave to say, could not possibly have been made by the learned judge, than that into which the learned judge fell upon the present occasion. And I will not allow it to be said for one moment, in dealing with this question, that there is anything doubtful, that there is anything speculative, that there is any new law to be laid down, or even any new topic in respect of the law about to be broached here, in dealing with the direction of the learned judge; for I speak with all possible respect for that learned judge's great ability and experience in his profession in Scotland, when I say, that this law which has been mistaken here by his lordship, is a matter of no perfect certainty, as thoroughly known, and as little drawn into doubt in Westminster Hall, where the law is administered touching the construction of the statute of James, the patent Act, as any one branch of the law most commonly known, and most frequently administered by our courts. It is one of the greatest errors that can be committed, in point of law, to say that, with respect to such an invention as that, it signifies one rush whether it was completely abandoned, or whether it was continued to be used down to the very date of the test of the patent, provided it was invented and publicly used at the time, twenty or thirty, or as, in this case, forty years ago, it is perfectly immaterial. There being, in my apprehension, no kind of doubt that the jury would say—"Why should we consider whether it was used at the Haxley Works or not? Why should we consider whether it was a trial or a completed invention?" He it so that it was used forty years ago—he it so that it was a complete invention, we hear the learned Lord Justice-Clark telling us that we need not trouble ourselves upon these facts, for it is enough for us if it was abandoned, and that takes the facts out of the case, and leads us to find a verdict the other way. Upon these grounds, my lords, we have no choice in this application, it being a bill of exceptions; we have no hesitation in saying that the law was misdirected, and misstated to the jury. The law is undeniable, it is a matter of no doubt or hesitation with any man in this country who has been accustomed to administer it, or I will venture to say with any practitioner whose opinion is entitled to any weight, and I am also of opinion that the law as laid down tended to mislead, and must necessarily have tended to mislead the jury. Upon these grounds I have no hesitation in supporting the proposition of my noble and learned friend, that the eleventh exception must be allowed.

Lord Campbell: After making some observations on other exceptions, said, in regard to the eleventh, the only question that remains is this, whether this misdirection shall be considered as immaterial. But, when I look at the form of the issue I cannot say that it was immaterial, because the issue is "whether the invention, as described in the said letters patent and specification, is the original invention of the petitioner." Now you cannot say that it was the original invention of the petitioner within the meaning of the issue, if it had been publicly known and practiced by others before the patent was granted. It has been said that there was no evidence; but I think that is a mistake—what conclusion the jury have come to I know not—but at the Haxley Iron Works there was such a machine, as Mr. Rutherford acknowledged at the bar, as would have amounted to an indication of the patent if that the use of it had been subsequent to the patent. Then, that being so, I have not what conclusion the jury may have arrived at. They might have thought that this was a perfect machine, that it was the same machine, and that it had been publicly used. If they had been of that opinion, although it had been abandoned, they ought to have found a verdict for the defendant. Under these circumstances, I regret exceedingly that I am obliged to concur in the opinion that has been expressed by my noble and learned friend, that this eleventh exception must be allowed, and the consequence of that will be, that there must be a *contra faciem* decision, and that the case must be tried by another jury.

RAILROADS IN GERMANY.—The last year's result of the German railways now open, shows an increase of nearly 5,000,000 of passengers in 1861, as compared with 1861; in the latter year the total number having been 2,071,345, and in the former 2,076,000; the total amount received, so far as can be calculated, is 7,000,000 Rhenish florins, or about 103,333,333, an amount which may be considered large, as the majority of the lines are yet incomplete, and those which are so, with, so much, become more profitable; and other lines, now in construction, shall work into them; and, in looking at the immense works now in progress in Germany, some idea may be formed of the vast results which must, in a few years, be obtained, and, with a railroad from Hamburg to Trieste, of one million, the journey may be made in about forty hours; so that the transit of the continent will not only be effected to a point, by some days, shorter than that at present, and the whole system of continental travelling undergo a change of such a nature as materially to modify the national character and political relations, as it would be almost to make a new world day as it is called on the frontiers of its present state, where, in the space of time he has lost, he might have travelled from the North Sea to the Adriatic.

THAMES HAVEN RAILWAY.—From a Correspondent.—During the last session of Parliament, the powers of the act of incorporation of this company were extended to their original term, and the directors are now using their efforts to increase the interest on the Havant share with the Thames Haven Company, by which means a saving in time of an average of three hours would be effected between London and Havant Bay, Chichester, Margate, and Ramsgate; this would enable them to reach these places at such periods of the day as would suit their convenience, instead of spending all the middle, or business portion of it, in the passage; and, at the same time, the time will be reduced—a matter so important to business as the saving in time will prove to be of great value. The railway can be completed in twelve months, at a cost of 100,000, and the finished scheme can be improved to 150,000, at a cost of 25,000, and more generally speaking, there will be little difficulty in disposing of these shares, or more as the connection with the Havant Bay railway is completed.

RAILWAYS IN FRANCE.

[FROM A CORRESPONDENT.]

As the French railways are beginning to attract, to a very considerable extent, the notice of English capitalists, and as we believe the British public are but imperfectly acquainted with the railway system in France, the following brief notice may not be unacceptable to our readers.

The railways completed, or in course of construction, before the session of 1842, were undertaken with more or less assistance from the state. The Paris and Orleans Railway Company obtained a liberal advance, on loan, from the Government, in aid of their subscribed capital, together with a guarantee of a minimum interest, or dividend, of 4 per cent. to the shareholders. The shares are held principally, if not wholly, in France. It will be opened throughout on the 1st of May. The Paris and Rouen Railway Company, authorized by Royal ordinance of the 15th of July, 1840, obtained a loan of 14,000,000, (rather more than one-fourth of the company's capital), repayable by annual instalments, with interest at 3 per cent. per annum, in thirty years, the first repayment not to commence until three years after the completion of the railway. The capital and directors of this company are French and English in about equal proportions. It will be opened to Rouen on the 1st of May. A company is formed, and authorized by Royal ordinance, for the further extension of the line to Havre. Government grants a loan of 4,000,000, towards the cost of the junction, so as to make the line continuous through Rouen. The stock of both these lines is held in England principally by the shareholders in the South-Western Railway.

After the Paris and Rouen Railway was undertaken, a pause ensued in railway enterprise in France. France, however, could not stand still while all the neighbouring states were becoming interested with railways. Accordingly the law of the 11th of June, 1843, was passed, which may be called the general railway Act of France. It contains the project of eight or nine great trunk lines of railway, radiating from Paris to the Belgian, German, and Spanish frontiers; to the Channel coast and the Atlantic; joining the Atlantic with the Mediterranean; and the Mediterranean with the Rhine. These lines, extending over about 2500 English miles, are not only, as it were, "set out" by this law, but a sum of 126,000,000, (upwards of 5,000,000, sterling), is voted towards their construction, and grants in aid of the cost for two years (1843 and 1844) placed to the credit of the Minister of Public Works. By this law, the state engages to defray the whole expense of land and compensation, in the first instance (to be subsequently repaid to the extent of two-thirds of the amount, by the departments traversed, and the communes more immediately interested); undertakes to pay for all the earthwork, masonry, stations, workshops, and buildings of every description; in short, to make the line and its dependencies up to the formation level—be the cost what it may—and then deliver it over to the company who shall have obtained the grant, to lay and maintain the permanent way, stock and work the line, and maintain it afterwards. Notwithstanding the very tempting inducement held out to the French capitalists to embark in the railways in that country, very little progress has hitherto been made towards carrying out the railway system in France. The Minister of Public Works has only two, or at most three, railway projects sufficiently matured to present to the Chambers in the present session. They are:—A line from Paris to Meaux, about thirty English miles, turning the right bank of the Canal de l'Oise into a railway. The canal is the property of the city of Paris, and held on lease for ninety-nine years by the canal company, who assign the residue of their term (seventy-nine years) to a company, in consideration of receiving from the latter a small passenger toll, undertaking to suppress the passenger-boats on the canal when the railway shall be opened. This company ask no assistance from the state, require no powers to take additional lands. They seek merely to obtain the sanction of the Legislature for the agreement between the railway and the canal companies. This canal being without a lock throughout its entire extent, the cost of the line will be inconsiderable. The locomotive engines and part of the stock will be supplied from England.

The second is an extension of the Paris and Orleans line (which is to be opened throughout, as already stated on the 1st of May) from Orleans to Tours, in the first instance, and subsequently, along the rich and fertile valley of the Loire, through Saumur, Angers, Amboise, and Nantes, to Saint Nazaire, on the Bay of Biscay. The capital is French and English in about equal proportions; and the direction constituted in the same manner. The conditions of the grant are understood to be settled between the company and the Government, so that the project will be immediately presented to the Chambers, and obtain final sanction in about two months. As this line from Orleans to Tours will be the first sanctioned under the new law, the conditions imposed by the Government for its outlay in constructing the works, will, probably, form the model for future grants to other companies. The terms are substantially these:—The Government defrays the whole expense of the land for the railway, and compensation to the landowners; of the earthwork, masonry, and all the works of construction; in short, makes the line and all its dependencies up to the formation level—be the cost what it may—and guarantees the stability of the works for one year. The company purchase the rails, chairs, and sleepers; lay and ballast the permanent way; and the locomotive engine, carriages, waggons, and the carrying plant generally. They stock, work, and maintain the line only, to which alone their capital is applicable, and their liabilities extend. They get a grant of the railway for a term of thirty-five years (to date from the opening of the line throughout) without liability to repay the principal, or even to pay the interest of the Government outlay in the construction of the works, or any portion thereof. During the first three years after the opening of the line throughout, the Government do not participate in the profits. After that period—deducting from the gross receipts all expenses ordinary and extraordinary of the year, making provision for a depreciation fund, and for a sinking fund, and 10 per cent. dividend to the shareholders upon their capital—the Government are to have one-half of the remainder, in the nature of a farm rent, for the occupation of the soil and freehold of the railway, and the buildings erected upon it, and, as the only equivalent they ask for the large outlay in the construction of the works.

The Government will not interfere, directly or indirectly, in the internal administration of the affairs of the company; they do not even require to be represented at the general meetings of the shareholders, but consent to take the half-yearly statements of the receipts and disbursements of the company, presented to the shareholders at large, as the basis of the amount to which the Government are to participate in the net profits. At the expiration of the term of the grant, the company get, either from the Government or from the company who shall succeed them as lessees of the line, the value of the railway as it stands, and of the stock, materials, and stores, to be estimated by valuation; or the grant may be renewed upon terms to be agreed upon between the Government and the company.

The third is the great line from Paris to the Belgian frontier, with one or more branches to the Channel coast, upon which an elaborate report has been published by Mr. Robert Stephenson. The grant of this line is understood to be admitted by certain English capitalists interested in the South-Eastern and Dover Railway, aided by the Messrs. Rothschild and other bankers in Paris. It is understood that the negotiations are in a considerable state of forwardness, and that the project will be presented in the present session of the Chambers, although the royal commission has not yet pronounced upon the second question, whether the communication in the Channel coast shall be by way of Amboise to Brest, or from Douai to Calais.

Of the several other trunk lines comprehended in the law of the 11th of June, 1843, nothing certain can yet be known. For the line from Paris, through Dijon and Chalon, in Lyons, there are several claimants, who each vigorously maintain their respective pretensions to the benefit of the Government grant of money. The only part of the course of this line as yet definitively settled is that part between Dijon and Chalon, which is defined by the general law itself, these points being common to the two great lines from Paris, through Dijon and Chalon, in Lyons, southwards, and from Marseilles, through Lyons, Chalon, and Dijon, northwards, to Mulhouse. The competitors for the benefit of the Government grant will be found substantially to resolve themselves into two. One party project a line beginning from an independent terminus in Paris, following the valley of the Seine, and passing through the city of Troyes, and pursuing a south-easterly course to Dijon. The principal promoter of this line is understood to be an emigrant in Lyons, who is desirous to supply the iron rails; he is represented in England at this time by a Paris banker of some celebrity, and a French agency house in the city. The promoters of the second project profess to avail themselves of the existing Paris and Orleans line as far as Corbeil, and to follow the valley of L'Yonne, passing through Melun, Montargis, Fontenay L'Yonne, Sens (with a branch to Troyes), Joigny (with a branch to Auxerre), Fontenay, Beaune, and Dijon.

The chief promoters of this competing line are the principal landed proprietors of the districts traversed by the line, among whom a considerable subscription is already raised. The following are some of them:—The Marquis de Louvois, Peer of France, president of the committee; M. Mauguin, Member of the Chamber of Deputies, vice president; Viscount de Bussy, Peer of France; Messrs. Schneider, Caillet, Mathieu, Viatre, Bouché, Polignac, Dupin, and several other distinguished Members of the Chamber of Deputies. Both parties are willing to compromise, and both are equally confident of success. The advocates of the marquis and his party, are, as yet, confined to France only.

GRAND RAILWAY SYSTEM.—The station for the general use of the Manchester and Liverpool and the Manchester and Leeds Railway Companies, at Euston Road, Manchester, will be one of the most extensive and magnificent things of its kind in the Kingdom. The Derby one alone occupied 100,000 feet long, and 100 feet wide, and covering two chains across. The road, which is to be of wrought iron, has been constructed by Messrs. Brown, Fox, and Co., Birmingham, by whom the splendid roof for the Manchester and Birmingham Company has been constructed.

PROCEEDINGS OF PUBLIC COMPANIES.

BANK OF ENGLAND.

The half-yearly meeting of the proprietors took place on Thursday, the 10th inst., when a dividend was declared of 35 per cent. for the half-year, ending the 5th of April next, deducting 7d. in the lb. on account of the income tax; and at which it transpired that formerly, in making up the account of the "rest," no value had been put upon the profit for bank notes which had been lost or destroyed from the year 1694, down to the present time, a period of nearly 150 years, and which, after due inquiry, was declared to be equal to nearly 500,000, making allowance for such old bank notes as might possibly be presented at some future day. The net amount of the "rest" was stated at 2,857,424, and adding 400,000, for the amount of notes so lost and destroyed as profit, and deducting 135,000, of estimated loss, the "rest" would amount to 3,122,924, or 3,232,924, if they took the amount of lost notes as equal to 500,000. The discovery of this hitherto unknown profit has naturally produced a very considerable rise in the value of Bank Stock.

MIDLAND COUNTIES RAILWAY.

The half-yearly general meeting of the proprietors in this company was held at the Athenaeum Rooms, Derby, on Wednesday, the 15th inst.—T. E. DICKY, Esq., in the chair.—The directors' report and accounts showed on the revenue account a balance in favour of the company of 19,683. 16s. 10d. equal to a dividend of 30s. per share, and 7s. 6d. on the quarter shares, equivalent to 3 per cent. per annum, besides paying the guaranteed dividend of 6 per cent. on the 30s. shares. A warm contest has arisen between this company and the Birmingham and Derby Company, which took up much of the time of the meeting; it originated in a proposed junction of the two lines, but nothing, however, was definitively settled, and, after a long discussion, the dividend was agreed to, the report and accounts were adopted, and the meeting broke up.

GLASGOW, PAISLEY, KILMARNOCK, AND AYR RAILWAY.
The half-yearly meeting of the proprietors was held in Glasgow, on the 27th ult., JAMES M'CALL, Esq., in the chair.—From the report it appeared that the traffic account exhibited an increase on the six months, as compared with the corresponding six months of the preceding year, of 347l. 7s. 6d.; the directors had instituted a searching inquiry, with a view to a reduction in the expenditure to the utmost limit, but they could not recommend a reduction of salaries and wages but to a very small extent. They intended gradually to augment the depreciation and contingent funds, and, for this purpose, had now appropriated the sum of 739l. 17s. 6d., and placed at the disposal of the shareholders 7812l. 10s., which would give a dividend of 12s. 6d. per share, recommended to be made payable on the 15th of March. It was expected the Kilmarnock branch would be open in April.—Some conversation ensued on the subject of the extension of communication between England and Scotland, via Carlisle, and the establishing steamers between Ardrossan and Fleetwood, but no resolution was come to on the subject.—Thanks were voted to the chairman, and the meeting separated.

SONS OF THE THAMES LONDON AND GRAVESEND IRON STEAM-BOAT COMPANY.

An extraordinary special general meeting was held at the Swan with Two Necks, on Wednesday, the 15th inst., in consequence of a requisition of shareholders, for the purpose of altering the clause in the Deed of Settlement, restricting the qualification for a director from twenty shares to ten shares, and for removing such of the directors and officers, and appointing others, as the meeting might deem expedient. Mr. NEEDHAM took the chair.—The SECRETARY having read the requisition and the notice convening the meeting, read the minutes of the last meeting, and, on the CHAIRMAN putting the question for their confirmation, Mr. DAVIS asked, if it was considered that this was a legal meeting?—The SOLICITOR being applied to, referred to the clauses in the Act regulating the manner of calling meetings, and gave it, as his opinion, that the meeting was legal.—A great deal of discussion, however, took place in consequence, from which it appeared that, at the last general meeting, a committee was appointed to investigate the accounts, and make other inquiries relative to the conduct of the directors, and giving them three months to institute the inquiry and produce a report—which period expires on the 10th of April—that, as a preliminary step to the removal of some of the directors, this meeting was called by requisition, for a specific purpose, mentioned in the notice, and that, under the Deed of Settlement, the report of the committee could not be received. Much noisy conversation followed, and a division took place on the motion—"That the business named in the requisition be proceeded with"—which was negatived by about 30 to 13, and the meeting was adjourned *sine die*.—A requisition was then signed in the room for a special meeting, to be convened for the 29th inst., to receive the report of the committee, and to proceed with the business intended for this day.

[A considerable deal of ill-feeling was exhibited at this meeting, and for which, indeed, there appears to be some reason, as, on the first year's running, a dividend of 10 per cent. was declared; on the second, 75 per cent.; and on the third (last), when an increase was expected, the shareholders were unexpectedly informed that, instead of a surplus being in hand for a dividend, the company was in debt 5000l.]

NEW EMIGRATION COMPANIES.

A new establishment, under the title of "The Emigrant Protection and Intelligence Office," is just coming into notice, and, from the prospectus issued, it certainly would appear a desirable source of information for all such as have made up their minds to leave their "native land" for either America, Texas, or the Canadas. The managers profess to act quite independently, without connection, either directly or indirectly, with any land company, and state that a long residence in the United States has given them a thorough knowledge of the laws, customs, and institutions of the country; and repeated voyages to and from England and New York, have made them aware of the frauds and gross impositions practised by the shopkeepers and merchants on the unwary emigrant, forcing on him double the necessary quantity of provisions of a most inferior description, at an exorbitant price. To check this cruel practice, and put the emigrant in possession of every information necessary for his comfort during the voyage, and his prosperity on landing, this concern is established; and we think an undertaking of the kind, conducted on honorable principles, would be a great boon to many, compelled, but unwilling, to leave home, in the anxiety of leaving home and kindred, perhaps for ever, are in a very unlit state of mind to set their affairs in order for the journey, with that method and economy, so necessary to their future welfare.

We notice also that a new company is in course of formation, called the "Catholic Emigration Society," at the head of which is Daniel O'Connell, Esq. In the prospectus issued, they notice that of the numbers annually flying from their native shores, to seek that employment and comfort which circumstances deny them here, nearly the whole of them are Irish Catholics. The clergy of the Catholic Church in Ireland have been consulted, and have promised to second the efforts of the association, whose principal object appears to be the colonisation from Ireland of the unoccupied parts of Illinois, Wisconsin, and other parts of the western states bordering on Lake Michigan, which are rich fertile lands, may immediately be brought into cultivation, and, in the present state of financial matters in America may be purchased on such terms as must prove highly remunerative to those who embark their capital in this undertaking, and as many persons might wish to support the institution, without becoming shareholders in the first instance, it is proposed to accept money on debentures, bearing interest, for which the whole lands of the society will be pledged, and the interest on which must be always paid before any dividend is made to the proprietors. The prospectus holds out great encouragement to shareholders; the capital to be 100,000, in shares of 10l. each, and should not sufficient be subscribed for, to commence operations, those who have subscribed are to have their money returned.

IMPROVEMENTS IN STEAM NAVIGATION.—A new steam-vessel has made several trips up and down the river, and her speed has created very great astonishment; she has been built for the Waterman's Steam-Packet Company, by Messrs. Napier, the engineers, of Millwall, whose two fast boats, the *Kilgobbin* and *Isle of Thanet*, excited great attention on the Ramsgate and Margate station last year. The hull of the new vessel is formed of iron, and the immense speed has been obtained by an improvement of a very peculiar description; there is a false bottom, which forms a condenser, and, by condensing the steam in the vacuum thus formed, the whole power of the engine (for there is only one, and of no more than 30-horse power) is applied in the driving of the boat, instead of being wasted in pumping water into the ordinary condensers. The steam is drawn into the condenser by an air-pump, and the cold water passes under and over it. The machinery occupies a very small space, and the consumption of fuel does not exceed a ton and a half per day. With these very small means, Messrs. Napier have succeeded in obtaining a speed unequalled in the annals of steam navigation. Her ordinary speed, with the tide, is 14 miles an hour; but she has actually proceeded down the river, with the ebb-tide, at the rate of 19 or 20 miles an hour. In one of her recent trips, she performed the distance from London-bridge to Greenwich Hospital, exactly five miles, in sixteen minutes, and on the following afternoon the same distance was effected in one minute less. The *Isle of Thanet*, a very fine Government steamer, with two engines and machinery of 10-horse power each, was passed by the new steamer, and there is nothing on the river which can at all compete with her. She is to be called *Waterman No. 3*, and is intended to ply between the *Isle of Thanet* and the *Waterman's* station at Greenwich.

RAMSGATE AT LIVERPOOL.—Yesterday morning, about one o'clock, the steam of an emigrant was suddenly felt in Liverpool and its neighbourhood. Passengers were awakened out of their sleep by the shaking of their houses and beds. No distant was the shock in Castle-street, that one tradesman jumped out of his bed, and ran into his children's room to see if they were all safe. The earthquake was felt on both sides of the Mersey.

ON CORAL REEFS, AND THEIR ARCHITECTS.

BY WILLIAM ICK, F.G.S.

Mr. Ick recently delivered two lectures on this subject, at the Birmingham Philosophical Institution, in the first of which, on introducing the subject, he stated that the structure of coral formations, if closely studied, was well calculated to throw much light upon more than one question connected with the physical history of our earth. The external appearance of atolls, or lagoon islands, was so curious, that no wonder the first seamen who navigated the Pacific Ocean beheld them with astonishment. Vast rings of dazzling white stone, rising abruptly from an unfathomable depth of ocean, the highest points sometimes capped with palm trees and other tropical vegetation, the waves dashing in foam against the outside, while enclosed within was a lake, or lagoon, of calm water, the surface of which was scarcely rippled by the wind. Sometimes these great walls of stone stretched, like immense break-waters, for hundreds of miles, along the shores of continents or large islands, often from eight to ten miles from the land—extending in magnitude, beyond all conception, the mightiest works of man; and yet these stupendous piles were the work of creatures which belong to the lowest type of animal existence, whose true position in the organic series is a sort of neutral ground on the confines of the animal and vegetable world; yet, so singular is the organization of these apparently fragile beings, that they thrive best where they are perpetually lashed by the waves of a restless ocean, in the midst of a surf that would dash to pieces the stoutest boat, or break into fragments the hardest rock.—Mr. Ick then explained, by the aid of large drawings, and specimens of various genera of recent corals, from the museum of the institution, the singular, but simple structure of the polyps, which form reefs, and also of the slender corals in the lagoons, and showed the mode in which the calcareous matter was deposited in the genera *Fungia*, *astrea*, *porites*, *madrepora*, *caryophyllia*, &c.; and concluded the lecture by explaining the distinctive characters of the three kinds of coral structures—atolls, barrier reefs, and fringing reefs; showing the advantage of thus classifying them.

In the second lecture, Mr. Ick introduced the subject by taking a rapid survey, by means of a large coloured map, of the vast areas of the earth occupied by coral formations. In the Great Pacific Ocean there is a tract, commencing at the southern end of the low archipelago and terminating at the northern extremity of the Marshall archipelago, 4000 miles in length, in which nearly the whole of the numerous islands are of coral formation. In the Indian Ocean, besides numerous other islands, the curious groups of the Laccadives, Maldives, and Chagos bank, extending in a line nearly 1500 miles, are all the work of coral polyps. But, perhaps, the most singular of all is the great barrier reef on the eastern coast of New Holland, which extends, with few interruptions, for nearly 1600 miles, at an average distance from the land of between twenty and thirty miles, and in some parts seventy. The whole of this immense structure is composed of coral; and besides these, which rise to the surface of the water, there are known to be many hundreds of reefs that are submerged, many of which are not marked down in charts.

But leaving the existing state of the world (said the lecturer), if we carry back our investigations to the most remote periods of its history, we find the labours of coral polyps among the first vestiges of organic existence imprinted on the rocks. In the Silurian limestone of Dudley (nearly the oldest formation which preserves abundant traces of animal existence) corals are found in such abundance, that we are led to the conclusion that the Dudley Castle hill, Wren's-pest, Hurst-hill, and the extended ridge of Wenlock-edge, are ruins of one or more great reefs of the ancient sea, which, possibly, like the great barrier reef of New Holland, stretched along the shore of the ancient continent, or large island, on which grew the luxuriant vegetation, the remains of which, washed into the lagoon channel, formed the different coral deposits of the centre of our island. (This view was illustrated by large masses of fossil coral from Dudley, in which the peculiar structure was beautifully preserved.) Above this group of rocks we have what is sometimes called the old red sandstone; but in Devonshire and Cornwall a group of rocks occur, usually considered to be of the same age. These abound with corals, numerous specimens of which were on the table. Above these lies the carboniferous system—in some localities preserving over considerable tracts the coral structure. On this repose beds of coarse sandstone and clay, supporting thick deposits of coal; and then beds of variously coloured sandstones, called the new red sandstone. A long lapse of ages intervening in this part of the world, in which, from the breaking up of ancient rocks, by volcanic or diluvial action, copious deposits of silica and alumina prevented the growth of coral; calcareous mud then began to accumulate, in a sea swarming with a new creation of lizard-like forms and ichthyosaurs, plesiosaurs, and the wondrous pterodactyl (or winged lizard), ammonites, nautilus, and a host of other marine animals, leaving their skeleton forms buried in the lagoon. Then began the little polyps to raise their giant structures, and lay the foundations of the extensive group of coralline rocks. The middle part of this series retains such abundant vestiges of coral structure that it is called the "coral rag." In some places it is a mere mass of corals of the genera *caryophyllia*, *agrarium*, and *astrea*, forming strata fifteen feet thick. In the lower coralline masses of coral form, several feet in diameter, similar to the existing porites on the outside of modern reefs. The coralline series of rocks occupy a zone, nearly thirty miles in average breadth, which extends across England, from Dorsetshire on the south-west to the coast of Yorkshire, crossing the German ocean, with few interruptions, across the north-west of France, by Charente, through the Jura Alps, across the continent, through Normandy, to the opposite English coast. This great circle encloses the chalk basin on which London and Paris are built; and it is impossible to trace over this band of limestone, broken as it is in its present state, without concluding that it is the remains of a large atoll, group of atolls, or barrier reef; and the resemblance to a modern reef is carried out even to the most minute particular.

In the museum of the Geological Society of London there are specimens of the calcareous sediment found in the lagoons of existing atolls. This cannot be distinguished in hand-specimens from white chalk, and the mode of its production is curious. Mr. Darwin noticed, at Heeling's Atoll, that two species of fishes of the genus *parrot-fish*, one inhabiting the lagoon, the other the surf on the outside of the reef, subsist by browsing on the more delicate branching corals; and, after the gelatinous part is extracted for the nutriment of these creatures, the fleshy ground calcareous matter passes from them in the state of a fine pure white sediment, and settles at the bottom of the lagoon. On opening several of these fishes, their intestines were found to be distended by this chalky matter. Some radiated animals also devour living coral, and the quantity of sediment deposited, layer upon layer, by these different creatures, must be very great; and if a section was made through the dried sediment of a large lagoon, the resemblance to a chalk basin would be strikingly apparent. If this view be correct, we should expect, in some instances, to find beds of chalk-like limestone among the more ancient formations; but the colour of a calcareous or other sediment will depend on local circumstances. If rivers bring down earthy sediment from high lands into the lagoon channel of a barrier reef, the pure white sediment will be coloured by oxide of iron, or other materials; and if carbonaceous sediment is brought down in considerable quantity, the limestone may be even black, as is the case at Kilkenny, in Ireland, some parts of Yorkshire, and other localities. Although we have no trace of chalk deposit among our English rocks anterior to the cretaceous period, Messrs. Murchison and Verneuil have shown that, in Russia, in the carboniferous system, there is a calcareous bed, extending over a district of not less than 1000 miles, which is not only white and friable, like chalk, but the strata are divided by beds of flint, which are sometimes concretions investing corals. This bed, in some places, abounds in a bivalve shell, called a *producta*, a genus characteristic of the earlier deposits. The surface of most of the reefs of the Pacific ocean swarms in such an extent with corals, and similar radiated animals, that it is next to impossible to walk over some parts without being lacerated by their spines; in some beds of the chalk, it is well known, the fossil remains of several genera of these creatures are found in great abundance. The flints of the chalk owe, in the majority of cases, formed up a nucleus of sponge. In the lagoon channels at Bermuda, and other places, where the water is shallow, sponges grow in profusion.

Mr. Ick then showed that the mode in which the beds of the coralline series had been formed, with the beds of Oxford clay and Kimmeridge clay interposed, was similar to what may sometimes be observed in modern reefs; after the period in which the partial deposit of Portland white rock place, he thought it probable that a reef was formed, on which occurred the ammonites, oysters, and other radiata of the chalk, the remains of which reef is only now found in a few spots; it exists, possibly, in the island of New Zealand, where there is a rock of light yellow colour, formed by an aggregate of corals, which retains their structure as perfectly as any existing corals. In beds of this formation—which is quarried, at Faversham, to the depth of forty feet—the corals, and most of the other fossils, agree with those of the chalk.

To complete the resemblance between the chalk basin and a modern coral formation, we have, in England, to the West of Exeter, most interesting vestiges of a tropical island, in the earliest stages of the middle reef, on which crowded gigantic bivalves, *Strophomena*, *Strophomena*, and other reptiles. From the size of the bones of this great lizard, called the *ichthyosaurus*, the creature must have been twenty feet in length. The vegetation on all of a tropical character; the genera *cyperus*, *panicum*, and *equisetum*, allied to *acrostichum*, are found in a silicified state. At Portland Island, and some other places, a layer of the earliest vegetable soil is preserved, from twelve to eighteen inches thick, in which the trees are standing erect, as they grew.

Mr. Ick then entered upon that part of the subject which gives the study of coral reefs so much interest, in a geological point of view. It had been ascertained that the coral polyps which formed reefs were capable of rising to a greater depth than about fifty feet, yet, very rarely the outside of a reef rises, the sea was found to be shallower. The difficulty was, to know how a wall of coral—rising from a depth, in some cases, of more than 1000 feet—could be raised. Mr. Darwin's theory appeared to be the only one which explained the difficulty—namely, that, while the coral polyps were building, the

ground beneath was sinking; and Mr. Ick showed that, while the coral is, in a long band across the Pacific, marked an area of subsidence, a corresponding, and almost parallel, tract existed in South America, from Terra del Fuogo, along the ridge of the Andes, to Mexico, where the land was, under the eyes of the present inhabitants, rising; and that corresponding lines of subsidence and elevation were apparent in the Indian ocean—the first being marked by the coral groups of the Laccadives, Maldives, and great Chagos bank, the latter by the volcanic district in the region of the equator; and that we were forced upon the conclusion that, while immense areas of our earth's surface are being elevated above their former level, corresponding spaces, no less extensive, are gradually subsiding; that the crust of our globe is undergoing a series of oscillatory movements, in the progress of which most important changes may be effected in its physical condition, on the distribution of land and water, on its climate, and the existence of organic beings; and that these simple coral polyps, urged by the instinct peculiar to their being, have constructed a series of geological chronometers, which enable us to mark the epochs of change in the history of our planet.

These lectures were illustrated by models and drawings of the most remarkable coral formations, in ground plan and section, by geological maps, by large drawings of corals, to explain the generic distinctions, and by specimens of recent and fossil coral, from the museum of the Philosophical Institution.

INSTITUTION OF CIVIL ENGINEERS.

MARCH 14.—THE PRESIDENT in the chair.—The two first papers read were by Mr. Macquorn Rankine, of Edinburgh, and were sent preparatory to his election as an associate of the institution. The first described, very clearly, a practical method of setting out railway curves, with precision and dispatch, by a method, which depends on the well-known principle, "that the angle subtended at any point of the circumference of a circle, by a given arc of that circle, is equal to half of the angle subtended at the centre, by the same arc." The operation of this method was shown to be practically superior, from its correctness and simplicity, to any other now in use among surveyors.

The second paper described an invention, by Lieut. Rankine, for suiting the action of the springs of railway carriages to variable loads; it consists in substituting, for the usual shackles or rollers, a small convex plate at each end of the springs, so adjusted, that, when the carriage is not loaded, it bears on the extreme end, giving the greatest degree of flexibility, but, owing to the convexity of the plate, the more the load is increased the nearer does the point of bearing of the plate upon the spring approach to the centre—thus giving it the necessary amount of stiffness to resist the pressure; the effect of the plate being virtually to diminish the length of the spring in proportion to the load, and thus to increase its strength in the inverse ratio of its length, and its stiffness in the inverse ratio of the cube of the same quantity. The experiments, and the practical use of this contrivance, on the Edinburgh and Dalkeith Railway, fully proved its utility.

The paper by Mr. Simms, "On the Application of Horse-power to Raising Water," gave the results arrived at from the use of nearly a hundred horses, working during stated periods, daily, at eleven shafts, drawing water by barrels, with "gin rolls," from an average depth of 104 feet. The shafts were sunk in order to enable a drift-way to be pierced, in the direction, and at the level of the base, of the Saltwood Tunnel, on the line of the Dover Railway. It runs through the lower greensand, which was so saturated with water that it assumed the character of a quicksand, and it became necessary to use the most strenuous efforts to draw off the water, and enable the miners to form the drift which was intended to operate as the natural drainage. The length of time during which the horses were employed enabled Mr. Simms to make extensive experiments, which were carefully tabulated, with all the attendant circumstances, and the result appeared to be that—rejecting all forced work—horses, working constantly for three hours, raised 32,943 lbs. one foot high in a minute; while, if they were forced to work constantly for six hours, they could only raise 24,360 lbs. one foot high in a minute. These results differ materially from the data which have been hitherto received, inasmuch as the eight hour experiments of Boulton and Watt give 33,000 lbs.; Trevelock, 27,500 lbs.; Sauvour, 34,000 lbs.; and Desaguliers, 44,000 lbs. Mr. Simms found that, if the horses were worked a longer time, or at a greater speed, they soon died; but that, with an average speed, and frequent relays, they bore their work well. From the regularity and the extent of his experiments, he assumed them to be correct, although they differed from those which had hitherto been considered standard authorities on the subject.

The papers announced to be read at the meeting of Tuesday, March 21, were—"Description of the Automaton Balance, invented by Wm. Cotton, Esq., Governor of the Bank of England," by T. Oliphant, Assoc. Inst. C.E.—"Description of a Smelting Furnace, and new Filling Barrow, in use at the Butterley Iron Works, Derbyshire," by S. C. Keeffe, Grad. Inst. C.E.

NEW MOTIVE POWER—THE CARBONIC ACID ENGINE.

Great as have been the results of the discovery of Watt, and the subsequent improvements on the steam engine, the advantages obtained by commerce and the arts from this gigantic power are purchased at a great expense—principally in the consumption of fuel; on the Great Western line, the item of "coke" alone amounting to 1000*l.* per week. From the simple known fact of heat increasing the volume of any of the elastic gases to a great extent, and giving, in that expansion, an enormous pressure, many attempts have been made to take advantage of this law of nature, to establish a power far exceeding that of steam, and obtainable at a more trifling expense. Dr. Faraday, by a long course of experiments on the liquefaction of gases, obtained a most important and detailed knowledge of their various properties, powers of expansion, and the pressure exerted under different degrees of heat; and it is upon the properties of carbonic acid and ammoniacal gases that the principle of this new motive power (invented by Isambard Bragg, Esq., of Cheltenham) is based. Carbonic acid is an invisible elastic fluid, half as heavy again as atmospheric air (100 cubic inches weighing forty-seven grains and a fraction), expands by heat, and can be liquefied by continuing the generation in close and strong vessels, at a temperature of 32° Fahrenheit, until the pressure of its own atmosphere accomplishes it. Twenty volumes at this temperature occupy twenty-nine volumes at 60°, and exert a power equal to 1095 lbs. per square inch; and the liquid acid, in expanding to gas, increases its volume 443 times. The mechanical properties of the ammoniacal gas are closely allied to those of carbonic acid gas, and, in undergoing a similar change, it occupies about 1040 times its original bulk. When one volume of carbonic acid gas is mixed with two volumes of ammoniacal gas both lose their elastic properties, and become a white solid (carbonate of ammonia); if water be present they will condense in equal volumes. By the separation of a volatile base by a fixed acid a definite salt is obtained, which, on exposure to heat, gives off the volatile gas, and leaves the acid behind; that a continual decomposition and re-combination goes on, giving out an immense power, and without any loss of material—the products always being the exact chemical amount used at the commencement of the process. Upon this principle Mr. Bragg's invention is based; and we hope, in a future number, to be enabled to give an accurate and clear description of the mechanical arrangement of the engine for bringing this power into practical use.

SUPERIORITY OF IRON OVER LEADEN PIPES.

The superior effects of lead, when in contact with an acid, on the constitution of animals is very generally known, and yet we have in common use in large towns, lead pipes for the conveyance of water to our habitations. The more pure and bright the water is, the more carbonic acid does it contain, and this, coming in contact with the leaden surface of the pipe, forms an active poison—the carbonate of lead. On an analysis of some water from one of the departments of the royal establishments (which was procured for the laboratory of the Royal Polytechnic Institution for the purpose) being made, it was found that in the first sample, which was taken from the pure spring, the water was perfectly free from any trace of lead. This spring, being at some considerable distance from the place where it is required (viz. the kitchen of her Majesty's household), it is conveyed thence through pipes of lead; on the second sample (mixed, taken from the pipes) being submitted to analysis, the quantity of lead therein amounted to 1.112 grains, or approximately 16 grains of carbonate of lead to the imperial gallon of water. There is, therefore, strong grounds for preventing that the disease, called "lead poisoning," in sporting phreology, and which now rages amongst the hounds there, is caused by the quantity of lead taken into the stomach of the poor animal; and what gives us a greater desire to promote some attention to the subject, is the fact, that not only the canine race, but the human also, are sufferers, as in more than one case a species of paralysis, and effects similar to the painter's cholera, has attacked the attendants at the kennel, out of whom (we believe one of her Majesty's whippers-in) is now suffering from it. Silver, stone, iron, &c., are all harmless for drinking, as dissolves in water, and should always be used in preference to lead, and the only advantage in using the latter appears to be its flexibility, rendering it a little easier in forcing angles, curves, &c., when being first laid down, then torn, but when so important a consideration is involved, as the health of the community, this trifling reason can have no weight. It would be a few prominent examples in the use of iron pipes from the water to the houses, and these examples made known and properly appreciated, to establish a complete substitution of iron for the old fashioned, but injurious system, of lead.

THE IRON TRADE IN BRISTOL.—An intelligent contemporary—lead gives a depressing account of the iron-trade in this country. Some extensive works of Mr. Butfield and Mr. Foster are "known not," and other proprietors will, no doubt, be compelled to do the same. It is well known that the business in the iron trade, as in many others, has been greatly hurt by the progress of iron-making, diminished by political pecuniary commotions, have made serious changes in "prices." This fact, alone, will compel the proprietors of iron-works to discharge their workmen.—*Literary Chronicle.*

COAL MINING OPERATIONS—No. IV.

CAUSES AND MEANS OF PREVENTION OF ACCIDENTS.

Having thus treated on the various subjects mentioned at the commencement of the report, the committee enter on a summary of the general conclusions arrived at, referring to the details of the report for the detail and premises by which they have been elicited and are supported, but having given each in its proper place as we proceeded, it is needless here to recapitulate them. The report concludes with an appendix, divided into seven parts, distinguished by letters from A to G inclusive. Appendix A is a description of Mr. Martin's plan of ventilation, in which is recommended the working of a mine in squares of half a mile each side, or two miles round the four sides; the up and down cast shafts to be at two of the opposite angles, and, by a peculiar mode of working, it may be safely accomplished, without either trap-doors, or boys to watch them, or inducing men to work by means of a pretended safety-lamp, both of which have been causes of most disastrous explosions. Appendix B is a description of a plan of ventilation by Mr. Penrose, of Leeds, which he effects by a powerful fan of peculiar construction, instead of the furnace; the latter, he asserts, is never sufficiently powerful, and if it was made so, it would, in connection with the sulphur, suffocate the men, and eventually set fire to the upcast shaft. Appendix C contains some minutes of circumstances connected with explosions, by T. J. Taylor, Esq., of Eardson.

1. *Tension of Fire-damp in Mines.*—On this important subject the author states he had long believed that the majority of great explosions is due to sudden issues of gas pent up in a high state of tension, and against which, therefore, no system of ventilation, or dilution, now in practice, can adequately guard. A few facts are mentioned, in illustration of the sudden and violent discharge of fire-damp; at Haswell Colliery an eruption took place under peculiar circumstances—the sectional area of the drift was thirty-seven feet, the quantity of air circulating in the drifts was 9700 cubic feet per minute, and the velocity 4.39 feet per second. The blow heard a noise all at once, similar to a rush of water, from the rapid discharge of the gas, fortunately the mine was being worked by safety-lamps, and no explosion took place. An officer, on examining the return channel, found it foul 310 yards back from the face; thus not less than 4000 cubic feet of hydrogen must have been discharged at this eruption, and yet no traces of it were to be found after half an hour, and this, in some measure, accounts for the obscurity which often hangs over the immediate causes of pit explosions. On the 20th September last, the master workman, John Harrison, was at work in the return air-course, where the current was traversing towards the upcast shaft, after circulating through the whole of the workings; he had two safety-lamps, one of Stephenson's, the other a Davy, hung on props near him; after working a short time, the Stephenson lamp went out, which caused his attention, and he saw that the Davy was filled with flame, showing that he was in the midst of an atmosphere filled to the firing point, and that it had suddenly become so, as there was nothing of the kind when he came there; he quitted the place, and made arrangements for the safety of the men in the mine, but returned in about twenty minutes, when he found the atmosphere free from admixture with fire-damp; attempts were made to trace this discharge of gas to its origin, but they were not successful, as neither crush or cavity could be discovered. There has not yet been any gauge of the tension of fire-damp under the circumstances, but we know something of the tension it is capable of assuming, where it forces its way through water in drowned shafts, as it must then overcome the vertical pressure of the water opposed to its issue. The writer had an opportunity of examining very closely one of these water-blasts at the Perry Main Branch, in March, 1840, and which, according to his calculation, discharged 12,600,000 cubic feet of gas in sixty-eight hours, being considered as expanded from its condensed proportions, to the volume it would assume at the ordinary pressure of the atmosphere.

2. *Law of the Diffusion of the Gases.*—From his investigations on this subject, Mr. Taylor considers that such calculations cannot be made on this subject, as there are, in all cases, practical qualifications which render any laws on the subject unavailable.

3. *Intermittent Nature of Pit Explosions.*—It has been observed that great explosions are not simultaneous, but intermittent; which is attributed, in part, to a communication with different reservoirs which are fired in succession, and it is still an interesting question, what is the cause of the cessation, and then of the renewal of the explosion?

4. *The Nature of the After-damp.*—As nitrogen appears to be the main agent of destruction, one circumstance worthy of investigation, is the cause of the peculiar, and not unpleasant odour of after-damp—a faint smell like ripe apples—air forced from the lungs of a man, who lived many days after the accident, had this odour.

Appendix D is an analysis of a piece of iron pyrites found in the Tyne and Wear coal mines, which gave, in 100 parts—iron, 51.00; sulphur, 49.00; insoluble coal, 7.00. Appendix E is a list of all the known explosions and inundations which have taken place since 1658, with the number, when ascertained, of lives lost; those by inundations from bursting in to old workings, show the necessity of a regular plan of registration. Appendix F treats of accidents in coal mines in Belgium, from which it appears the number of accidents in the provinces of Hainaut, Liege, Namur, and Luxembourg, from 1821 to 1840, was 1450, producing 9148 deaths. The number of men employed, on an average, during the above period, was about 25,000. For the relief of the sufferers and their families, a fund is raised by a subscription of less than 1*l.* in the *l.*, on the wages of the workmen, the proprietors subscribing an equivalent to their men, some granted from Government, and donations of private individuals. Appendix G is a memorial, by M. Jore, read to the Royal Academy of Paris, in 1776 (before alluded to), by M. Jore, of observations on the circulation in mines, and the means best to be employed in maintaining it. It is interesting, principally, from being the first really scientific production relating to proper ventilation of mines, and though it gives many useful practical ideas, it would not be considered data to be acted on in the present day. Here the report ends, and we have, according to our promise, given the most important part of this interesting document, thus placing before our readers, who may not have availed themselves of a copy, the results of the indefatigable and humane labours of, perhaps, the most useful committee for a particular purpose that could be, or ever has been, appointed, involving, as the subject does, the physical comfort, and moral improvement of a large portion of our labouring population, necessarily employed in a most laborious and dangerous occupation—the advancement of science as related to mining, and, in a national point of view, the economical attainment of some of the most important descriptions of the staple produce of the kingdom.

EMPLOYMENT OF FEMALES IN COLLIERIES.—In the House of Lords, on Tuesday last, the Duke of Richmond presented a petition from the female employed in Admiral Sir P. Durham's collieries, in Fifeshire, complaining of the operation of this Act, and praying for an amendment of it. The noble Duke also presented petitions in the same effect from the workmen employed at Aberdower, Fifeshire, the Carron Company's works, and in the Earl of Kilmorlie's collieries, in Fifeshire.

DISPUTED RIGHT TO MINERAL PROPERTY IN IRELAND.—We understand that an outrage occurred in the colliery district of the Queen's County, a few days since, arising out of a "family dispute" as to the possession of a valuable coal mine. It appears that Mr. Heronson, the gentleman who claims to be the owner of the mine, made a lease of the property entirely in his own name, while his brother and sister, who are advised that they possess an equal title, refused to admit the tenant. On Tuesday last, forcible possession was taken on the tenant, with the aid of about 200 persons, provided with sieges, hatchets, &c. The possession of the engine house was undisputed to be obtained by Mr. Heronson's brother-in-law, but the doors were broken open, and he was dragged out, and was only saved from serious violence by the intervention of some gentlemen of the neighbourhood, who were present. Informations have been received against the parties who are stated to have taken violent possession of the property in question, without any legal title.

ARTESIAN WELL AT BRIGHTON.—Since our last notice of the Artesian well at the end of the Chain-pier, the workmen have succeeded in getting about eight feet below the solid bed of gravel, a rock peculiar to Brighton, which some time before had retarded their further progress, and fresh water, or water only slightly brackish, has been found. Above this bed of rock the chalk was reported about every three feet by this strata of flint; but beneath it eight feet of solid chalk have been passed without meeting any other substance. This bed of rock is supposed to be the same as was pierced at a depth of seventy feet, in sinking some wells on the Marine Parade, opposite the pier, and below which abundance of water was found; and if this supposition be correct, the chance of procuring a supply of water in the well at the Pier-head is much increased. The depth now attained at the Artesian well is thirty-eight feet, and the depth to the bottom of the bed of rock about thirty; if, then, we add to this latter number thirty feet, the height of the pier-head from the surface of the ground, and multiply fifty feet, the height of the Marine Parade above the Pier-head, we shall get a total depth to the bed of rock at the Pier-head, as from the level of the Pacific, of 170 feet; and since in the wells alluded to, the rock was met with at a depth of seventy feet, on natural inclination of the chalk strata of 100 feet in about a quarter of a mile is shown to exist, a circumstance which, on the principle that water always finds its level, appears to be highly favourable to the project of a jet. We understand that the boring is still in progress, and it is to be hoped that our water has been met with, the directors, even if the undertaking should not be immediately successful, will continue to prosecute the work.

PAVING AND JOINT-ROCK BARRIERS.—From the return to the House of Commons, just published, giving an account of the number of each class of the above houses, according to actual registry, it appears that the number of private houses in 1831 was 512, which, last year, had decreased to 511; the joint-rock houses, on the other hand, which, in 1837, amounted only to 100 in number, have increased through successive years to the present number of 118.

STEAM TO CORK, CALLING AT PLYMOUTH.—
—The ST. GEORGE STEAM-PACKET COMPANY'S splendid and powerful

. All heavy goods for shipment to be sent to the St. George Steam Wharf, Lower East Smithfield.

BOLTON AND PRESTON RAILWAY COMPANY.

TENDERS FOR LOANS ON MORTGAGE.—The directors of this company are prepared, under powers of their Acts of Parliament, to **RECEIVE TENDERS for the LOAN of MONEY**, in sums of not less than £200, and for terms of three, five, seven, or ten years, and to **GRANT MORTGAGES** of the said undertaking, and of the rates, tolls, or monies arising therefrom, as securities for such loans, bearing interest at the rate of 1 per cent. *per annum*. **INTEREST WARRANTS**, for the whole term for which the loan shall be made, will be delivered to the lenders along with the mortgage, and the interest shall be paid half yearly, or quarterly, in London, or Bristol, or as may be preferred. The tenders are to express the sum and the term of years for which the same are proposed to be lent, and to be addressed to the secretary, at the company's office, Bolton.

By order of the board of directors,
PETER SINCLAIR, Secretary.

SHEFFIELD, ASHTON-UNDER-LYNE, & MANCHESTER RAILWAY.—TENDERS FOR LOANS.—The directors are prepared to GRANT MORTGAGE, under the powers of their Act of Parliament, FOR LOANS OF MONEY, in sums of not less than £200 each, and for periods of three, five, or seven years, at the option of the lender.—Interest, at the rate of 5 per cent. per annum, will be paid half-yearly, for which interest warrants will be given for the period agreed on, payable at the company's bankers in London, Manchester, or Sheffield. Further particulars may be obtained at the company's offices in London, or Sheffield, at the office of Messrs. Parkes and Smith, Solicitors, Sheffield; Messrs. Hagburn and Stevenson, Manchester; or Messrs. Johnson, Son, and Wetherall, Temple, London.

By order,
J. PLATTORD, Secretary.

Manchester, Feb. 15.

THOMAS HAVEN RAILWAY COMPANY.—The powers of the company having been extended by a further Act, obtained during the last session, and since solemnly recognised, after argument, by the unanimous judgment of the Court of Common Pleas, the court of directors have determined to take advantage of the present promising state of the share market to COMMENCE the UNDECK LAKING within a single line of rails, deferring the execution of the works. They are assured by their present engineers that, on this proposed plan, the expenditure will not exceed £210,000 for the railway and landing pier. Further information may be obtained at the office of the company, 7, St. Mildred's Court, Poultry.

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IMPORTANT PATENT IMPROVEMENT IN CHRONOMETERS AND WATCHES.—E. J. DENT, 52, STRAND, who obtained the high distinction of receiving the Government Reward for the unparalleled performance his best chronometer ever submitted to twelve months' public trial, begs to acquaint the public that the MANUFACTURE of his WATCHES, CHRONOMETERS, CLOCKS, is secured to him by THREE SEPARATE PATENTS, respectively granted in England, France, and the United States, and he begs to state, in plain, concise terms, that he is now offering his watches, such as, in plain, case from \$40 to \$100 extra.—Gold Horizontal-Watchers, with dial, from \$200 to \$400; do. \$175 extra.—Do's of "Appendix" to his recent work

NOTICES TO CORRESPONDENTS.

MINING JOURNAL is regularly published about two o'clock on Saturday afternoon, at the office, No. 10, FLEET STREET, where it can always be obtained, and there is no need for telegraphically in its receipt. In town, either (than unpaid) as in part of the signal through whom it is ordered, but, as respects the transmissi-

and to country education, the scheme is shared with the Post-office authorities.

... to a man to know. It was simply a quarrelsome dispute, such as are so
very common, and, in our opinion, should have been settled without going
to court. We shall not, therefore, lend our columns to the publication of state
facts which would needlessly widen the breach between parties whom we would
fain conciliate.

U. S. Senator Chubb — One reporter attended at the meeting of the United States Life Company, as requested, but was refused admission, on the plea of lack of accreditation, and that the matter could not be discussed. The reporter stated:

11th St. James's street. — We thought have been happy to comply with the request of our correspondent, and the subject has in any way connected with the results of our investigation. *Proceedings*, 22nd Feb. 1871. See also *Proceedings*, 22nd Feb. 1871.

It is open to the poorest laborer, by availing himself of the advantages of education, to rise to the same position as those employed in mines or on railways—we shall then, willingly, find room for his production.

Mr. T. J. Gorman, appeared in person and was sworn in our chambers; the witnesses examining them can be had on application at our office, or through any book-keeper or messenger.

...and the knowledge of them, we say, is essential. If, in consequence, the most important, scientific steps will be taken to identify a representative of the world.

IMPROVEMENT IN THE MANUFACTURE OF SALT.—The following in-

...of the manufacture of silk has been tried and proved successful in
the... silk manufacturer, of... although he has not
and it is his belief for the manufacture of silk, and to witness the
... in persons in the above business, as it will be a great saving both of

put a canoe, made with anything which can be removed on or off at will, by pulling it. It will be found to move the greatest part of the wall from itself on or over the few landmarks, with the brain is again

...the back part of the pan. It may be done by heating a number of
the oysters together, similar to a stew, with a pan upon the top rim, almost
touching the oysters, over each fire, with the front part of the pan towards a stove burner.
The back end of the pan is placed against the wall of the stove, and the

the greater part of the rail will come back on the east, thereby, in good season, save the gas from burning. By adopting this method, will be cost some building considerable, though, in reality, the boiling will

expressed in part, and thereby cause the crystals to fall more freely than the old system of open pans.

[illegible]

THE MINING JOURNAL,
Railway and Commercial Gazette.

* Parties desirous of ordering the *Mining Journal*, can do so, either direct to the office, or through any news-vender or bookseller in town or country. Notices of irregularity in its delivery are requested to be forwarded to the office, where every attention will be made to rectify the error of omission.

It is, doubtless, of the first moment, in this country, where lawyers are to be found in shoals—and who must, necessarily, have therewith on which they can exist—that we should have various courts of judicature and appeal, to which the disappointed suitor may have recourse, as a last resort; and experience has hitherto shown that, on application to the superior courts, in nine cases out of ten, where the slightest grounds are adduced to warrant the judgment of the Court, cases are again referred back, or, at least, so procrastinated, as to militate much against the interests, and not to effect the ruin, of the parties to the suit; while the legal advisers well fill their purses at the cost of their clients.

The LORD CHANCELLOR, in expressing the opinion he entertained, and on which his judgment was formed, stated, "that if it is proved distinctly that a machine of the same kind was in existence, and was in public use—that is, if use, or if trials, had been made of it, in the eye and in the presence of the public—it is not necessary that it should come down to the time when the patent was granted. If it was discontinued, still that is sufficient evidence in support of the prior use, so as to invalidate the letters patent. If it is discontinued—provided it has been once in public use, and the recollection of it has not been altogether lost—if it has been once publicly used, it will be sufficient to invalidate the letters patent, although the use may have been discontinued at the time when the letters patent were granted."

LORD CAMPBELL, in following the noble Lord, observed that the chief point at issue was, "whether the invention as described in the said letters patent and specification is the original invention of the applicant," and on this he based his decision, in delivering which he observed that, from the evidence adduced, it was clear that a machine of the description referred to had at an antecedent date been employed at the Bradley Iron-Works, which, supposing such had come into use subsequent to the patent being sealed, would have been an infringement of the patent; but as such had been employed a good many years before such patent was obtained—although it might have been abandoned at that precise period when the patent was taken out—there could be no question that the patent was, under such circumstances, invalid.

Having, in our last, offered some few remarks on the letter of SAINTSBURY, the secretary of the Southampton Docks Company—but being precluded, on that occasion, from entering fully on the several matters treated on in his letter—we now revert to subject, and, with more time and space at our command, will endeavour to fill up such *lacunæ* as, upon a careful re-perusal of the *re*, and further inquiry, we find to exist. We distinctly stated, in reference to the 251 shares taken by certain of the directors, which they gave their acceptances—the shares being duly registered in their names, but which they subsequently repudiated, having claimed them forfeited, and, at the same time, withdrawing and cancelling the acceptances so given—that no question, we thought, could be, as to the legal holding on their part. Hence the legal demand, on the part of the company to payment of the several calls, for which bills were, from time to time, given—and, we believe, there is question, however special pleading may be resorted to, which alter our position, or render the worthy directors exempt from the claims which exist on behalf of the company, on account of shares which those gentlemen appropriated to themselves.

appears, however, upon further inquiry (your authority being the books themselves, but information acquired therefrom), that there is error in stating that the forfeiture of the shares in question took place at the meeting in August last, inasmuch that such shares were actually forfeited on the 11th of April, 1942, being ten (10) days, and not six months, prior to the presentation of the accounts.

counts of the company, disclosing the circumstance; the mistake arising, on our part, from the belief that the directors would not have produced, at the half-yearly general meeting, held in August last, a balance sheet which was not in strict accordance with the truth—for, whatever may have been the irregularity of their acts, we did not, for a moment, assume that they had "palmed" on the proprietors, false accounts. We trust this error, into which the directors have fallen, is open to explanation, as, in such case, we shall be most ready to set them and ourselves right with the shareholders and the public.

It cannot be concealed that the transactions in the Southampton Docks Company have excited more than ordinary attention; not from the importance attached to the company *per se*, or its directors, but as being one of those *exposés* which lead parties to think, and perhaps to extend their imagination so far as to calculate on the possibility of such things having been done in other quarters. It is on this account that we are induced to proceed with the investigation, and to give insertion to facts which bear upon the question; while, if there is another motive which actuates us in this course, it is the proposed application to Parliament—a copy of the bill being now before us, and on which we shall at once proceed to offer some few observations, which appear to us to be applicable at the present moment.

The original capital of the company was 350,000*l.*, of which amount it appears only 272,344*l.* 10*s.* has been received (in the proposed bill, 272,860*l.*)—thus leaving a deficit of 77,655*l.* 10*s.*, of which but a small portion may be expected to come into the hands of the company. The next fact to which we have to direct attention is, that, on the face of the accounts, it appears that shares, which represent 50*l.* capital stock, have been re-issued at 20*l.* per share, and, moreover, loan-notes of 30*l.* have been issued, giving to the holder the call or claim of shares of 50*l.* each, in lieu of the amount so advanced—and, therefore, so far as these two classes of securities are concerned, we have 30*l.* representing 100*l.*, the former being the amount of the two respective sums, which, together, represent two shares. If we are right, then, in the deduction thus drawn, it is clear that on 747 re-issued shares, and 747 loan-notes—the one being at a discount of 30*l.*, and the latter at 20*l.* per share—we have a reduced capital of 37,350*l.*, and we also find that 26,500*l.* has been borrowed on debentures. What may be the effect on raising the proposed capital of 350,000*l.*, under these circumstances, we leave the shareholders to judge, for we presume a case will be made out, on the part of the directors, which will pass muster with a committee of the House of Commons.

Having directed attention, then, to two principal features, we have only to consider the position in which the company is placed in their appeal to the Legislature for increased powers; and we think we shall set forth such a case, as will render it essentially necessary that the directors should act *bona fide*, so far as they are individually concerned, ere their representations can be listened to by a committee of the House of Commons. We have heard it oft said that, in proceedings at law or in equity, you are expected to go into court with "clean hands;" if such be the case in the courts of justice, surely the like will be required in an appeal to an assembly where honour and justice are considered as the bases of its construction. We will now, then, proceed to the case, about being submitted to the House, as the grounds on which increased powers are solicited. In the first place, the directors declare, in one of the early clauses of the bill proposed to be passed, that the object of such bill is "to raise a further sum by the creation of a further capital, or joint-stock, of the nominal amount, or value, of 350,000*l.* to be subscribed for in such parts, or proportions, as the said company, or the directors for the time being, shall appoint." Here, then, in the onset, we find that the directors seek for a power to be placed in their hands to raise a further sum of 350,000*l.*, or, in other words, to double the capital of the company on such terms (for that we believe to be the meaning of the phrase) as the directors shall appoint. Truly, we know not which most to admire, the ingenuity, or the ingenuity, displayed on the part of the directors, who have already given us so glaring, if not satisfactory, evidence of their desire to uphold the company, if not their own characters. The course, we think, under the circumstances, should such become known to the committee, which will be adopted, is, that any further capital which may be subscribed, will be by a fresh "Subscription list," so that the original shareholders may, to a certain extent, be protected; or, at least, that powers be not given to a board of directors, who, by their acts, have given the most conclusive evidence of their inability, at least in their own opinion, of doing justice to the body of shareholders and themselves. We believe that there are instances on record (the Southampton Railway among others) where the power to raise additional capital has only been granted upon a probable source having been shown, from whence the enlarged, or extra, capital might be contemplated.

We have, hitherto, dealt only with the monetary part of the bill, which, indeed, is the most important feature; but it is right we should look to the preamble, as well as the clauses of which it is composed, wherein we find the following words:—"Whereas, the said company have made considerable progress towards the construction of an inner and close dock, and of a lock connecting the same with the tidal basin."—Now, we are told that the progress made with the inner dock is far from considerable, and, moreover, that a very general opinion prevails on the part of the shareholders that it should be first clearly proved that profits will be made on the outer dock, ere the second be further proceeded with. This may be matter of opinion; and we, therefore, see no reason why the directors should not take "the benefit of the doubt." We think, however, the very circumstance of shares, nominally of 50*l.*, and ranking as such in any division or participation of profits, having been issued at 20*l.*, requires some little reflection ere further capital be expended, with questionable results—it moreover being, we believe, an admitted fact that, even at the sacrifice of 60 per cent., so made, the directors were unable to dispose of the entire number of shares, at such reduced rates; while the exercise of the power vested in the company, of raising 150,000*l.* by way of mortgage, has, we believe, been very trifling indeed. Hence, we may assume—if the directors (the directors, let it be remembered) be empowered to raise a nominal capital of 350,000*l.*, on such terms, and in such proportions, as they may think fit—that such will be of a nature ruinous to the interests of those who have already embarked their capital on the faith of the representations made by the directors at the several meetings, and which, with their accounts, have, unfortunately, proved fallacious.

Looking, then, at the whole case as it stands, we cannot believe that Parliament will grant the powers required by the amended Act, unless, indeed, a fresh "Subscription list" shall accompany the application to the House; but, should not such course be adopted by the committee to whom the bill will be referred, we then consider that a clause will, at least, be inserted, to the effect, that no part of the money shall be raised at a greater sacrifice than—per cent., and that further expenditure in the construction of the inner, or close dock, shall not be incurred without the sanction of—proprietors being obtained in writing; or such other clauses being inserted as will prevent the controlling power in the proprietors, and not leave it entirely with the directors.

We shall continue to watch the progress of the proceedings of this company, and to offer such further observations as may appear to us to be of importance in the House of Commons—should the directors proceed further, of which no notice has yet been given—while we have no doubt that proceedings of a different nature will afford employment to gentlemen of the silken robe.

DATA FOR THE USE OF BLAST-FURNACE MANAGERS AT IRON-WORKS.—No. IV.

BY SAMUEL BALDWIN ROGERS, ESQ.

(Mineral and Metallurgical Chemist, Nantyglo, Monmouthshire.)

ON THE BLAST.

The quantity of atmospheric air driven into a blast-furnace, to make a ton of pig-iron, will depend upon the facility of the residuums of the minerals at a given temperature; in the usual run of coke-furnaces, in this district of country, and with a cold-blast, 360,000 cubic feet, or 27,000 lbs. (12 tons 1 cwt. 8 lbs., which is reckoning 1000 feet of air to weigh 75 lbs.), may be taken as a fair average; the exact quantity can only be ascertained by the operative managers themselves, in their several localities—all I profess to do in these "letters," is to furnish a groundwork for their calculations, which may at all times be safely depended upon.

The atmospheric air contains variable portions of water—the quantity being more or less, according to the temperature of the air, from 1/10th of its weight, at the freezing point, to an 80th at 59°, and a 40th at 86° of Fahrenheit's thermometer; hence, at 32°, the water in 360,000 feet (27,000 lbs.) of air will be 1684 lbs.; at 59° it would be 3374 lbs.; and at 86° it would amount to 675 lbs. Here we have the principal cause why furnaces fall off in their make of iron (often to the extent of 20 per cent.) in hot and sultry weather. Barometric pressure will certainly cause a material difference in the quantity of air supplied to iron furnaces, but the fluctuations in that pressure are too changeable to be satisfactorily calculated upon, and, therefore, I omit all reference to them, for the difference being in quantity and not in quality, it will not at all affect my calculations as to the action and reaction of a given quantity of blast upon the materials in a smelting-furnace.

Some authorities state that the mean quantity of water held in every cubic foot of atmospheric air, in this climate, is 3.789 grs.; this would indicate that 360,000 feet of air would contain 195 lbs. of water, or 19½ gals. Portions of carbonic acid gas are also to be found in the atmosphere (omitting all other impurities), varying, in quantity, from 1 to 2 parts in 1000, or from 27 lbs. to 54 lbs. in the quantity of air required to make a ton of iron. The data taken here is a cold-blast of 3000 cubic feet of air per minute, or 4,320,000 feet per day (twenty-four hours), make 12 tons of iron. Every furnace manager should, however, as correctly as possible, ascertain the exact quantity he actually employs, and which he may, with sufficient accuracy for all practical purposes, readily do, by dividing the number of cubic feet proceeding from his blast-engines to his furnaces, in the course of a day or a week, by the number of tons of iron made—say, so many feet area of his blowing pistons—multiplied by their motion in feet per minute, hour, day, or week; this will give the quantity of air delivered for use in the times stated; there should, however, due allowance be made for leakage of apparatus, and for the regurgitations of air at the tuyers, and for the escape at the temps, which, in some cases, will amount to 10 per cent. of the blast. One of the advantages of using hot-blast, is the adoption of closed tuyers, which effectually prevents all regurgitations, and, consequently, is the means of conveying a larger quantity of air into the furnace in any given time.

There has much less attention been paid to a due regulation of the blast of furnaces than the subject deserves, for, it is an acknowledged fact, that the temperature of a furnace will depend entirely on the quantity of air decomposed therein, over ignited fuel, in any given time; and, therefore, it may safely be depended upon as a truth, that if the earthy residuums in iron furnaces will not fuse into a clear, colourless, and fluid glass, or cinder, at a temperature generated by a current decomposition of (say) 3000 cubic feet of air per minute, impediments will inevitably accumulate round the hearth and sides of the furnace, more or less, as the local heat may be inadequate to bring the residuums into that state of liquidity to permit of their readily flowing away at the cinder notch of the furnace.

The partial, or imperfect, fusion of the residuary earths of the ore, the limestone, or flux, and the ashes of the fuel, is the origin of nearly all the difficulties experienced in blast-furnace management; to avoid, or vanquish, which difficulties, an extra temperature must be generated, by the decomposition of more atmospheric air, upon an extra dose of carbon in a given time, or by employing a hot-blast, or air heated to the required degree, previous to its introduction into the furnace; hence, it manifestly appears, that a hot-blast is an equivalent for an extra decomposition of air and combustion of fuel, within the furnace, its effect entirely depending on its temperature; its action has no other difference, whatever from that of a cold-blast. The impure rotteness, or weakness, of hot-blast iron, arises from a cause perfectly distinct from that of the air being heated to any specific temperature, as may be readily and plainly shown, were it not for prolonging these letters to an unnecessary and inconvenient length. A nother, and equally efficient, remedy for the imperfect fusion of the earthy residuums of blast-furnaces, may be found in the use of a more active flux than what is generally used—one that would bring such residuums into a clear and colourless glass at the usual (or even at a lower) temperature of the furnace—consequently, there are three ways of remedying or obviating the difficulties above-mentioned—viz., 1st, to decompose more atmospheric air, and also more fuel, in any given time, so as to raise the temperature of the furnace to the desired degree; 2d, to employ a hot-blast, which, in effect, is precisely the same as decomposing more air and fuel, but with the peculiar advantage of there being no residuums to vitiate the process; and, 3d, to introduce an extra flux, that shall cause the earthy residuums to flow away at the usual (or, if possible, a lower) temperature. On these points may be said to hang all the difficulties of blast-furnace management, and, therefore, there cannot be too much attention paid to them, and more especially the last; for, as long as a smelter depends upon a specific charge of limestone (supposing that material to be of a good and uniform quality, which is very seldom the case, at large works, for a week together), to bring into sufficient fusion the residuums of his flux, and apparently uniform, charges of mine and fuel, which at one time shall amount to 1000 lbs. on the ton of iron made, and at another, at an interval of only a few days, perhaps, 1200 lbs. (a very common occurrence), he will inevitably be disappointed in his results; and, to remedy this evil, there is no other possible safe and certain road for him to pursue, than to repeatedly refer to the components of the minerals upon which he may have to operate, and that by analysis only; all other modes of proceeding will be merely guess-work, and, therefore, alike uncertain and unsafe. It is true, that furnace managers (who, it is to be regretted, are very seldom permitted to sort and select their materials) frequently do make alterations in the charge of limestone, but they make such alterations only when they find the cinder on the fall of the furnace has changed for the worse, and then they have to wait for two, and frequently four or six, days before the evil is counteracted, experiencing, during the time, a material loss of quality, and sometimes of yield also, in the iron of four, eight, or twelve sows; the aggregate loss at large works, on this head alone, would amply satisfy those persons who may be unacquainted with the irregularities of iron furnaces under the present system, or rather non-system, of management, and it is nothing but the immense capital employed at such works that enables the proprietors of them to proceed with their operations over such drawbacks as here alluded to, with comparative success and satisfaction.

The high pillar of blast at present used (i. e., 2½ lbs. pressure per square inch) is imagined to be necessary, in order to penetrate into the hearth of the furnace, through relatively small tuyeres, and also through the materials, the earthy parts of which, about the bottom of the hearth, are generally in a state of semi-fusion; it is, however, the quantity, and not the density of the blast that is of importance in the furnace, for, if a due quantity can be introduced, it is of little consequence as to its density. From some recent trials in this neighbourhood, a much lower pillar of blast than 2½ lbs. per inch has, with large tuyeres, produced very superior work; and both reasons and analogy point out clearly that it should do so, for the temperature of furnaces is, as above shown, necessarily regulated and supported by the quantity of air decomposed in any given time (hot-blast being merely an exception), and hence we may safely conclude, that if 3000 feet of air are used up in one minute of time to produce a certain temperature, 4000 feet, decomposed in the same time, and under the same circumstances, would yield one-third more heat, and, consequently, bring into fusion earthy materials, that, at the present temperature, would be only a paste, or semi-fluid mass; and, if only 2000 feet per minute of air be used, the heat must necessarily be one-third less, and materials which would readily fuse in the first case, would then begin to set and adhere to the cooler parts of the furnace; in this predicament the hearth and bottom would, in a comparatively short space of time, be filled up by the coke and clots of iron, as they fall, becoming enveloped in a mass of imperfectly fused cinder, similar in consistency and tenacity to baker's dough, were not the iron to be melted by the blast, and react as a flux upon the other materials, and thus cause the

impediments to flow away from the furnace as a black "scowering cinder." It should, however, be observed, that there are other causes which will produce a "scowering cinder," besides a deficiency of blast; for instance, if the earthy residuums will not fuse, at the usual temperature of a furnace (when she may be said to be working well), into a clear and liquid glossy cinder, they will stick, more or less, to the sides of the hearth and bottom, and produce a similar result to that just described as arising from a deficiency of blast, and the only salvation to the hearth is, under present management, a "scowering cinder," for sometimes many days together, and with a sacrifice in yield and quality of iron that would defray the expense of analysing materials, and of an efficient auxiliary flux, probably, twenty times over.

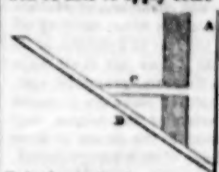
[Observations on the BLAST will be concluded in the next letter.]

ORIGINAL CORRESPONDENCE.

ON THE VENTILATION OF MINES.—No. V.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The various methods of applying the motive-power, which have been noticed in the former papers, will have each their peculiar advantages to particular places. Their success will altogether depend on their judicious selection and adaptation to the circumstances which they are best calculated to suit. Every officer, or agent, who knows their several merits, will be able to apply some one of them to advantage, as it may best suit his purpose. If the pit, or mine, be sunk upon ground that rises rapidly, then an air pit to the crop will be of advantage; or, if such a pit be not sunk, then the pit, being divided by a brattice into two, a drift, driven thro' the strata, as in fig. 1, where A is upcast, B is downcast, C is the air drift, and D is the coal vein, &c.



We give this view to show what should be done, when only one pit is sunk, but we always approve of two. The other modes may be employed to assist this natural and cheap mode, when it is found deficient in power. In flat and even ground, however, this natural facility does not exist, and then we should always advocate the method of a furnace being placed at the top or bottom of the pit, and then, by rarefaction and by combustion, a sufficient current will be induced; care, however, should be taken to have, in one case, a *first air drift*, through which all air should be admitted not fit to be passed over or through the fire, either in a flaming or in a state of incandescence; and in the other, where plenty of air is to be had, a diluting quantity should be admitted, that safety may be preserved. In the case of a level being worked by driving into any mountain from a valley, and having an air pit sunk on the level, or on the workings, to ventilate the places, care should be taken that there be no reflux of the current, or else the return air may be unexpectedly brought again upon the lamps or candles. If a reflux do not actually take place, a sort of stagnate may be produced, which will charge the mine generally, or in particular places, with carburated hydrogen. This may not have been observed generally, but we have ourselves seen it frequently happen. We account for it thus:—If the pit for air be of a given depth, and sunk on the mountain, or on its side, then it will at all times naturally cast up, except in very hot weather, and in the heat of the day, when it will be disposed to flow out into the valley, in consequence of the heat found in the valley surpassing that found in more elevated places.

The plan of finding the quantity of air passing in any given place or time, is, generally, that of causing any one to sit to windward, in a good and favoured spot, and, having measured a certain distance—say, twenty yards—you, with watch in hand, sit down, and order him, at hearing a particular sign which is given, to smoke freely; then you count the seconds of passing until the smoke arrives. This is one way, but, perhaps, a good anemometer, made to register the time, would be much better; that should be put in a particular place, to be seen by all having charge, and, if possible, under the immediate care of the furnace manager, who should thoroughly understand the instrument. He then could push, or impede, the furnace, as circumstances might require. We have seen a very simple one answer very well. A barometer should also be kept in each colliery office, accessible to those who have charge, and a thermometer could easily be placed in the upcast air pit, so as to be influenced by the heat of the air in passing up, and yet be inspectable by agents, &c. The anemometer would be excellent, as a portable instrument, to detect the state of the air passing in the mine. Such a one as you reported, a few months ago, in the Journal, working on the principle of the barometer, and, by an excellent contrivance, ringing a small bell attached when danger approached. This would, in our estimation, be an excellent companion to all having to try the fire, as it is called, or for any agent of mines. We now close our observations on this subject, by stating it, as our opinion, that, if possible, every winning of a colliery, as it is called, should have two pits sunk for working, one upcast and another downcast, for the air. For want of this, we have seen some valuable lives lost. The enemy seems to be so secret, and, when met, so powerful, that the utmost vigilance is absolutely necessary, or more lives will be sacrificed by fire damp than by any other cause.

Corn Annon, March 7.

VENTILATION OF MINES.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The subject of ventilation of mines is well worthy the attention bestowed upon it in the columns of your Journal, for, according to the old adage, "in the multitude of counsellors there is safety." Experience has proved that, under certain circumstances, the safety-lamp is not a sufficient protection against the dangerous mixtures of carburated hydrogen and atmospheric air, either from the ignorance or folly of the miner in rashly exposing the flame, or from the existence of a current of air, by which foreign matters on the external surface of the wire gauze are heated to such a degree as to occasion explosion; or, otherwise, from his slighting the notice given of the presence of noxious vapours in the lengthened flame of the lamp, and the peculiar smell attached to them. While the miner is inattentive to his own safety, becoming rash from his constant exposure to danger, it cannot be expected that any scientific discovery or mechanical contrivance will wholly remove the danger. Mr. Goldworthy Gurney, in his evidence before the Select Committee on Accidents in Mines, suggested the use of artificial light, by placing seven lights of the first order in the flame of seven true 12 inch parabolas, arranged within a circle of three feet diameter, by which the longest mines of the kingdom might be effectually illuminated, the obstruction of stoppings being overcome by the introduction of pieces of plate glass in the door, so as to admit the passage of light through it, or a second light might be brought in an opposite direction—the narrow galleries, when requisite, to be widened, so as to admit the passage of the reflected light. Now, it does not appear to me that this plan has ever been acted upon, although far less expensive than many of those pointed out by some of your correspondents, and, undoubtedly, far more safe; it is certain that no plan can be generally adopted, unless by the process of boring, or shafts, the difficulties arising from the tortuous nature of the galleries be effectually overcome; as convinced are the Cornish miners of this, that the application of a greater number of shafts than is used in the collieries is very general, and the consequence is, that no mines in the world are better ventilated—and, indeed, this plan of ventilation is a necessary auxiliary to Mr. Gurney's plan, to enable the light to pass freely from gallery to gallery, which could not be done with good effect otherwise, from the density of the gases, as well as being generally necessary for the purpose of examining the vein. I am much inclined to doubt the efficacy of introducing either hot or cold air into the mines, unless it can be shown that, by so doing, the dangerous state of the atmosphere of the mines is neutralized, or, otherwise, that the noxious vapours are carried off through the upcast shaft, for it often happens that a few minutes are sufficient to introduce within the chamber a sufficient quantity of this gas to form an explosive mixture; or, as Dr. Clanny observes, it comes on like a flash of lightning, and, if it be the shock-damp, it is certain that, unless the current of air is very strong, its specific gravity will condense it to that part of the mine in which it is generated, for even in open walls, and large vessels, it most tenaciously maintains its position, although exposed to the open air; and I much doubt whether the plan of Mr. Martin, of sinking a shaft at the lower end of the intended mine, and forming from this a gallery round three sides of a sub-range, terminating in an up-shaft, would, independent of the vast expense, answer any of the purposes contemplated. It appears to me, that the due attention is following the workings through the shaft driving the

coal seams, much mischief may be avoided, for it is evident that the effect of a thrust breaking the thrill is to liberate the imprisoned gas beneath, causing a sudden outburst, which, in many instances, would negative any human attempts to neutralize its powers, the only means of safety left being a speedy retreat; the carbonic acid gas seldom accumulates in this very sudden manner, and its immediate effects upon the flame when reaching it, are sufficient warning for a speedy retreat. When sulphuretted hydrogen—the most dangerous and insidious of all gaseous compounds—is abundant in mines, the same difficulty of applying a certain and effectual remedy exists; for, issuing from old wastes, or fissures of the mine, it penetrates at once the energies of the workman, and, unless immediate assistance is obtained, he is suffocated, and the flame of the candle being unaffected, no indications are afforded of the existence, or sudden evolution, of this gas. I do not think that any supply of air could be obtained to neutralize this destructive vapour in sufficient time to save life, although its presence would prove beneficial in ultimately clearing the mine of the noxious vapour. The present mode of ventilation, by means of the furnace, causing a circulation of air throughout the mine of about three feet per second, has been found efficient for all the purposes of ventilation in the generality of mines to which it has been applied, but against this mode of ventilation it has been urged, that, if there is a current of air exceeding 300 feet per minute, it would drive the flame through the meshes of the safety-lamp. Again, it is a question, whether the atmospheric air introduced into the pit, by whatever mode it may be done, extends its volume over the whole pit, through the various galleries and chambers, or whether it only forces itself through the gaseous products of the mine, carrying off only a portion of these gases, in replacement of the loss of a portion of its own volume; I am inclined to be of opinion, that it does not at all times carry away the products of foul mines as fast as they are generated, and, consequently, they must be deemed unsafe. Whatever plans are proposed for the ventilation of mines, and the greater safety of the miners, they must be such as are at once economical, and suited to the purses of those to whom they belong—otherwise, there is little hope of their being adopted.

NEW THEORY OF APPLYING STEAM TO AN ENGINE, WITH A NEW PROCESS OF EVAPORATION.

Sir,—Observing in your Journal an improvement on the steam engine, by Mr. Sims, for the purpose of using the same steam again, and working at a lower pressure, I beg leave to draw the attention of practical engineers to the circumstance of these two important objects being attainable to the full extent by my patent process of evaporation. Although the same steam is not actually used, its heat is applied in carrying on evaporation similar to my plan, described in your Journal of 28th January. Suppose a steam-boiler, similar to, and placed alongside, the one described, and to be covered with a non-conducting substance to save heat; the internal fittings and plan of working to be the same in every respect as the boiler to which heat is applied, but, instead of one, there will be two processes of evaporation, and, of course, two discharges of steam and water into the steam chest, as shown in the diagram. The steam, after having worked the engine, passes into the one end of said boiler, and allowed to escape at the opposite end by a pipe, with an exit steam throttle attached to it, and a stop-cock for running off the condensed water below. Should the process of forcing the hot air from the chimney to the steam chest be applied, it is clear that the heat of the steam in the chest will be of a higher temperature than the steam in the boiler exposed to heat; it, therefore, follows, that the evaporation will be even greater from the waste steam vessel than from the other. Although it may appear strange to many, that steam without pressure should indicate a greater heat than steam under pressure, it is nevertheless a fact that has been proved, and Mr. Josiah Parkes adds his testimony to the fact, in his report, recently published, on Mr. Perkins's steam boiler.

SOUTH SHIELDS REPORT—PRACTICAL MINING EDUCATION.

Sir,—I have read with interest, and, I trust, with profit, the extracts and also review, in the Mining Journal, of the Report of the South Shields Committee, on the Causes, and Means for the Prevention, of Accidents in Mines, and would beg to offer a few observations on one or two of the heads of this luminous report. It may appear presumptuous in one so illiterate, and so humble in station, to attempt to criticise the views and opinions of gentlemen who have brought forward such an array of facts, with discrimination and judgment to me and suggest so many notable improvements, yet I hope my being one of that class from whom has hitherto been selected the practical guides and directors of mines, will be considered an ample apology for giving my opinion.

I believe it will be admitted, the mines in these islands are as shily conducted as those of our continental neighbours, where science and practical knowledge may be said to be divorced, or how comes it that we are purveyors of practical knowledge, and not rather importers of their scientific scholars; there is no shilling scale here, I believe, to prevent them landing in our country. Let us, however, see how this South Shields Committee propose carrying out the education of officers for viewers and under viewers, before they can be legally employed. You disband branches of science are enumerated, and to complete this professional education by a course of practical mining in some fitting institution in the heart of a mining district. And they allege a fitting institution already exists, were it somewhat extended and legally sustained—viz., the University of Durham. To this I would remark, that my belief is, that 50 out of every 100 who possess mining property in this country, and a knowledge of practical mining, would consider even barbarous Egypt as a fitting place for the education of viewers and under viewers in practical mining; but, if we are to take hints from our neighbours, what objections can there be to an industrial and scientific education, such as is adopted in some of the continental towns, for the improvement of manufactures; this, to be sure, might not be thought to be "obscuring" for the profession, but it would, I think, prove more useful and elevating to the great body of miners, which ought to be the first consideration; and it surely would be more rational and natural, to bring the school to miners, than to bring nothing into the school. "The solitude and darkness of the mine," is resorted to bearing practical mining; may be said to possess the brightness of the Sun's light, whereas, within the walls of a college, there can only be a glimmering of sunshine. It may be objected, that practical miners would not all themselves of the equipment of a scientific education, even although suitably brought within their reach, and that their labour in the mine would be for study, even of those minerals which are by no means obscure. To this it might be a sufficient reply to say, look at the great efforts and tremendous expenses made by the most illustrious of men who are now the directors of science, to obtain literary and scientific knowledge (and, although the amount of such knowledge may be said to be little, as may it also be said of the host of scholars, all learning is little), and their opportunities were even less twenty years ago than now, although by the two limited yet; and, as regards their labour, I know no difficulties to stand in their way—such as might be named, are capable of being turned into assistance in practical science. This class of men, then, must, in the opinion of every well-regulated mind, possess superior claims to have provision made for increased facilities for their improvement, so that of the various means of acquiring knowledge for scientific and practical purposes, particularly when it is required for their advancement, that practical miners, even those of average talents, shall be delivered from legal appointments, as viewers or under viewers, without a certificate from a university, and "whose certificate should be imperative before permission be granted to assume an important and a scientific." Were it not that the absurdity of this proposition carries with it its own refutation, one might be disposed to look seriously at this threatened despotic enactment, deferring to that benevolence which is so proverbial to befalls. I know it will be contended, that I am one of that class, whose prejudice and interest will see that one craft would be to destroy by the proposed institution; in this I shall say, were it only the few of us who, who might be prevented from following their natural avocations, by being prevented to exercise of responsibility, and who might suffer along with the mineral wealth of my country, it would give me comparatively little concern, but when I see a "heavy burthen and great disadvantage" to the education of all, except such as can afford money or interest to procure a university certificate, or, in addition, I think, would be too great to stand such a calamity. The prospects of these benevolent men who confer their reports to the public, and the rights of the great mass of mankind (as if there were only a part of the human race), ought to be looked on with great dis-

trust. Reference has been made to the effects of Napoleon, as regards mines; I perfectly agree that we might learn many useful lessons from that great (although, as I think, bad) man. To whom was he indebted for his success, but to practical men? Had he required a college certificate before appointing viewers and under viewers in his armies, would he ever have been able to cope with the richest and most powerful nation in the world, and to have brought the whole continent of Europe under his sway?—so much for the ladder by which he rose. To what was his fall to be attributed?—to his turning round on those nations who had welcomed him as their deliverer, and telling them their first duty was to himself! the second duty towards France!! and that all their other duties towards their own country was to rank after them!!! In like manner this learned committee would persuade us that all local knowledge and local interests should be secondary to that of sustaining the college graduates—and all for the interest of humanity, forsooth! A WORKMAN.

March 12.

[We are well pleased that our able correspondent has directed his attention to the subject, and have only to express our surprise that we have not received other communications from parties who know not only how to appreciate the value to be attached to the report, but the promulgation of whose opinions would be valuable to science, as well as useful in advancing the object in view.]

MINING IN IRELAND.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—In your valuable Journal of the 4th inst., I observe a letter from your correspondent in the county Waterford, "On Mining in Ireland." That the subject, so neglected by the English capitalist, has been taken up by the Irish gentry, is pretty evident, from the fact, that in almost all the concerns lately commenced in this part of the country, Irishmen are alone concerned; there are at present five companies in this immediate neighbourhood, who are most actively engaged in laying open the mineral resources of this part of the country—viz., Coosheen, Wheal Bandon, Roaring Water, Ballislahob, Consolidated, and West Carberry. The ore at Coosheen and Wheal Bandon is a rich grey, with quantities of carbonate of copper on the back of the lodes; but, at Roaring Water, the lodes are of a very different description—large quantities of friable quartz, with a fine greenish, being found near the surface, making bunches of rich black and grey copper; but, in depth, the ore changes to a very rich yellow red, free from sulphur. I have seen and heard a good deal of the plan heretofore pursued as to mining in this country—expensive London establishments, with careless, and often ignorant, agents, rather wishing to obtain a good name for themselves, by allowing the workmen good wages, than looking after the interests of their employers, have been the sole cause of any failures. The gentlemen now engaged in working these mines, in the first place, have no capital to throw away; and, secondly, have profited by experience; and I have no hesitation in stating, that this is a far wider, and infinitely cheaper, field for advantageous investment, than any that has yet come under our notice. The miners' wages vary from 1s. to 1s. 3d. per day; men who—Englishman as I am, I must admit—can do the common work required quite as well as Cornishmen. In ground requiring timber they are any thing but expert, never having had any experience, as hardly any timber is required. The common labourers are a most hard working set of fellows, and will work for twelve hours for 8d. or 9d. I shall conclude these observations, by urging upon the English capitalist and miner not to expend more money—I may say, almost fruitlessly—on foreign mines, which have involved such enormous losses, but in future to attend more to an island (within, I might almost say, a few hours' sail from your homes), offering the inducement which this country does; and as to parties talking of being afraid, as I have heard some say, it is preposterous—you may travel at all hours of the day or night, and meet with nothing but the greatest civility and a hearty welcome.

A WELL WISHER TO IRELAND.

Ballislahob, County Cork, March 11.

[Ireland has one best wisher, and we hail with pleasure the novelty of Irishmen being found ready to develop, and, we hope, profit by the mineral resources of their country. We are not prepared to go so far as our correspondent does as to the past, but we will hope that the present adventurers will, at least, avoid falling into an error to which is ascribed the want of success, or further extent of mining operations in the Sister Isle.]

SUPERIORITY OF IRON AS A BUILDING MATERIAL.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—Through the columns of your valuable publication, permit me to call the attention of the proprietors of West Indian property, to the great advantage of iron houses over those of stone or bricks, in all countries subject to earthquakes; had this been the case at Gaudaloupe and Martinique, the great loss of life and property would have been very considerably less than it has been upon the late melancholy event, which has spread destruction over so many families in those islands. The subject of substituting iron for a building material, only requires to be more generally known to insure a very great consumption of it for these purposes, to the mutual advantage of both consumer and producer. As a friend to the mining interest of Great Britain, I am sure you will not consider any apology necessary for thus intruding upon you these few hasty remarks, and trusting you will allow them a corner in your next week's publication.

Newcastle-under-Lyme, March 16.

A SUBSCRIBER.

ANTHRACITE IRON—HOT AND COLD-BLAST.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—I have looked forward with some anxiety to your succeeding Numbers, since the last letter (treating on the subject of the superiority of hot-blast over cold-blast (or vice versa), in the manufacture of pig-iron with anthracite, but am sorry to say that I have gleaned but little information. The absence of any remarks on your part, except as regards the use of anthracite for furnaces of boilers, in which I take some interest as an anthracite proprietor, induces me to believe that some understanding has been come to between the rival powers, and hence the question, so far as the public is concerned, may be considered to be at rest. If such be the case, I venture to submit to you, and to the parties engaged in the hot and cold-blast warfare, that it is only due to you, as well as to your readers, that one or other of the belligerent powers should announce the terms of armistice, so that we who look to benefit ourselves, by the working of our mineral tracts, may be able to hold out to the capitalist and to the ironmaster those sound and legitimate prospects which practice and experience fully justify, whether as affects the one or other mode of smelting—so that anthracite be the fuel employed. I will not further trespass on your space, but trust that these gentlemen who availed themselves of your columns to vent their spleen, and to promote their own ends, will feel that they ought only in fairness, on retiring from the field, to put us in possession of the knowledge as to which is the most economical mode of smelting iron with anthracite (I mean with reference both to quantity and quality)—hot or cold-blast?

AN ANTHRACITE PROPRIETOR.

[We have not heard of any armistice or compromise being made between the parties, nor do we believe such has taken place. As the period has nearly arrived for Mr. Budd's specification being enrolled, we presume we shall hear more on the subject, and shall not fail to give insertion to any matter treating on the question, to which we attach considerable interest, as affecting so vast a portion of the Swansea district.]

ON THE ORIGIN OF MINERAL VEINS.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—Messrs. Thompson and Deakin, like flying snakes, have commenced an element alien to their nature, in order to escape from the enemy; and, like them, they soon sink exhausted into their own native duplia. Mr. Thompson is as clear of imparting his practical information (if he has any) as he is anxious to figure in the eye and bell. More of science have but one wish, and that is, to instruct those to whom instruction must be truly valuable, and, by the aid of liberality and common sense, to bring the miner to a more just and liberal view of things; and, even I am, that the selfishness in wanting to the title of philosopher. I speak of the common objects and common phenomena of Nature, familiar to those who visit the various parts of the earth, of independent truths, founded in common sense, to children and the unlearned, but, as it appears, wholly unknown to the practical miner, for so Mr. Deakin informs us. The specimens he asks for are so unobtainable, as though he considered on such topics were in accordance, as to abundance in the stones composing his own native hills, our public and private museums being replete with them, and many of the inferior beds of the earth—may, hills and mountains—being wholly composed of the organic remains of species long since extinct. From whom Mr. Deakin derived his ideas, that there are no mineral beds in Devonshire, and that the igneous material is only pressure and water? Not from common sense, I trust; the material of this and other burning speculations is

the abstracted mineral matter of the lower as well as of the superficial beds, being ejected as lava, like a river of molten iron or lead, or consisting of such varied material as is found in beds deeper far than Mr. Deakin ever penetrated; the volcano is fed by mineral matter—hence the enormous quantities of sulphur common to most of them. Again, there are lakes, springs, and reservoirs of water, which have the quality of converting wood into stone, the wood preserving its organic structure; in the Bovey coal formations we distinctly observe the gradual transition of wood into coal, and in most countries organic animals and vegetables are found converted into ironstone, iron pyrites, quartz, and other substances. Mr. Thompson is asked for bread, and he gives a stone; he will admit no theories but his own—no facts but such as are consonant to his own narrow and restricted views: let it be so, but, at the same time, let him give us a specimen of what he does know. Practical knowledge must, indeed, be valuable, if we are to wade up to our necks in the mire for it. In answer to his childish question, I have to observe, that consolidated matter, in deposition, is often directed or governed in its course by local peculiarities, giving way to impediments, as the waters of a river charged with mud or sand give way to a pile of rocks or solid earth placed in the middle of the stream, and re-uniting after this impediment is past; there are proofs that some faults are contemporaneous with the vein—others long after, and others long before, the vein was formed.

Oxford, March 5.

DRY-ROT.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—It is superfluous, almost, to say, that what are called "dry-rot plants," and which are, though harmless, generally considered the criminals implicated in the deed of destruction, are entirely innocuous, and not to blame. The work of destruction has not only commenced, but has advanced far on the march of entire decay, before the *merulius destructor*, or *merulius lacrymans* (the latter a misnomer), make their appearance, and they spring up as the product of decay, originating, no doubt, in the decomposition of unelaborated sap, in immature wood. Kyan's cure, and Sir William Burnett's prevention, have both been called in question. The former is, at any rate, altogether problematical, if we may be allowed to judge from the contrary of statements and opinions. The application of the corrosive sublimate solution is founded on the assumption that "dry-rot" proceeds from the decay of the albumen of the sap, but some salts of copper will coagulate albumen as well as chloride of mercury. Ten years before Kyan ever studied the subject, as far as the public are aware, I proposed, through Sir John Barrow, their secretary, the following process to the Admiralty:—Having proved that sulphate of iron was a preventive of "dry-rot," I recommended the timber to be impregnated with the solution in the following simple manner:—An air-tight case, such as that used when steaming timber for vessels, supplied with the wood, was connected at one end with the pipe proceeding from a boiler, furnished with a stop-cock; and, by a shaft from below, united with a tank containing the metallic solution—this shaft, or pipe, having, in like manner, a stop-cock. The case being filled with steam from the boiler, a jet of cold water condensed the steam, and formed a vacuum, and the stop-cock, in connection with the tank, being opened, the solution of sulphate of iron rushed up into the case, and impregnated the wood to its very core. I have yet to learn a more effective method for the prevention of "dry-rot." I am not now speaking of the extreme danger of using wood impregnated with corrosive sublimate, in many cases, such as the extreme folly of using timber thus impregnated, wherein to raise mushrooms; one would imagine the risk sufficiently great in using these apocryphal cures at all, much more when saturated with corrosive sublimate. J. MURRAY.

March 8.

STREET PAVING.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—The slippery and very dangerous state of those streets of the metropolis which are paved with wood, calls loudly upon the inventive spirit of the age for an immediate remedy. It is a remarkable fact, that while we are extending the use of wood as pavement throughout the metropolis, the people of New York are equally solicitous to substitute stone in the place of wood, the latter being condemned as exceedingly dangerous, and annoying as it wears. It is evident that there is a radical defect in the modes of preparing and laying the wooden blocks; in the first place, the concrete foundation, otherwise desirable, retains all the water falling on the streets, and percolating through the interstices of the wood, thus facilitating its decay and wear, and also the accumulation of mud; and, secondly, the plan of grooving, as now adopted, is most decidedly unsophisticated, as it facilitates the expansion and spread of the fibres, and, consequently, is the means of making the streets still more slippery after a short exposure to wet weather. If wood alone is to be used, the foundation should be of that nature as to admit the waters freely passing off into the drains, and the blocks should be disposed to form unequal surfaces; but I do think that the co-operation of iron will be found extremely beneficial, either as suggested by a correspondent in your Journal, or as a substitute for both wood and stone; the use of cast-iron for public and private residences, is rapidly extending, why not have some of the most public streets paved with the like material, employing, as was intruded some years ago, square pieces of cast-iron, suitably shaped and dovetailed. The experiment was successfully tried in the Blackfriars-road, and it was then intended to extend its use, but why the plan was not carried out, I do not know. The pieces laid down in the Blackfriars-road, resembled a batch of eight or nine rolls as taken from the oven, being united like the parts of a disintegrated map, without interstices or palpable joints. Something must be done by the existing wood paving companies, or it is evident that other companies will spring up to do it for them.

Pondry, Feb. 28.

PERFECTIVEUS.

[We are disposed to doubt the correctness of the assertions made with reference to the "iron way" in Blackfriars-road; which, if we remember rightly, was near Holland-street, on the declivity from the bridge, and certainly not, we will admit, a fair test. We remember seeing it in a very distorted form, and it was subsequently removed, after several accidents had occurred, and its general inconvenience admitted. It is quite clear that an iron surface is more dangerous and slippery than that of wood. We have heard of saturating the blocks with certain compounds, and other measures—also a proposed stone, which will obviate the difficulties and inconveniences now experienced, on which we may have more to say on another occasion.]

SOUTHAMPTON DOCK COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—In the observations which you make in your paper of Saturday last, relative to the Southampton Dock Company, it seems to be implied as your impression, rather than as your conviction, that I am not amenable to your criticism on the points to which you refer. I think it right, therefore, briefly to say, that I did not become a director, nor even a proprietor, of the Southampton Dock until February, 1842—that is to say, above two years and a half after the date of the transaction of which you complain.

March 15.

AARON AARER GOLDSMID.

[We did not, in the slightest degree, intend to imply that Mr. A. A. Goldsmid was culpable, or had a knowledge, of the transaction; and, we think, a reference to the article, in last week's Journal, will not only acquit him of any participation, but ourselves of any intention of alleging a knowledge on his part. We then wrote without Mr. Goldsmid's authority, we are glad to find even the "conviction," fully confirmed by the preceding letter.]

SOUTHAMPTON DOCKS COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—As a party, happily not very deeply, interested in the affairs of the Southampton Dock Company, I cannot but be a ward to you the good of peace as justly your due, for the bold and manly way in which you have exposed the proceedings of the directors. You have, Sir, done much service, in times gone by, in exposing abuses; and I was in hopes that the severe censure you have, on more than one occasion, inflicted on those gentlemen, would have had the effect of preventing a repetition of their mischievous doings; but I regret to find that there are yet some men so malicious and inaccessible to all shame, and so devoid of all principle, that, in the present instance, if it be not the worst case to which you have pointed attention, it is quite bad enough to warrant severity of exposure and exposure. I cannot think otherwise than that the directors must be held liable for the amount which they represented to us they had paid on their shares (for the books prove the payments made); and I trust that Mr. Blincoe, or some other public-spirited proprietor, will bring the question forward in a court of law or equity, where, with even glaring facts as evidence, we might secure a verdict in favour of the company.

Chesham, March 16.

A SMALL HOLDER.

[Some observations on the proceedings of the directors, and the sums due to the company with the report which has taken place, as relative to the proceedings of this company, will be found in another column.]

DEANE'S DIVING APPARATUS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR.—It is more than twenty years since I proposed, for the prompt recovery of the bodies of the drowned, an apparatus similar in principle to that of Deane. The plan was published in the *Hull Advertiser* at the time, so that it is no posthumous claim that I now advance, and I still think that such an apparatus might be most serviceable as an adjunct to the Royal Humane Society's various machines, to afford aid in case of accident, and to rescue from the water the bodies of such persons as may have sunk beneath the surface. The plan simply consisted of an air-tight hood, or helmet, resting on the shoulders; a double tube was connected with this helmet—the one for the escape of the heated and expired air alone, and the other, entering from below, supplied fresh air, injected by a powerful condenser, at the other terminus. You will see that the principle is essentially that of Deane's diving apparatus, but my proposition was published, at least, twelve years before Deane's name was known to the public.

DELETERIOUS AIR IN MINES.

TO THE EDITOR OF THE WEST BRITON.

SIR.—Will you have the goodness to state, in your columns, what gases most contribute to render the air irrespirable or deleterious to the Cornish miner? By so doing, you will lead a valuable hint to the chemical fraternity, and much oblige your constant reader,

J. R., a Chemist.

Southampton, March 2.

[Some of our scientific mining readers will, probably, be kind enough to furnish the information which our correspondent requests, and, meanwhile, we may refer him to a valuable paper which appeared in the *Report of the Cornwall Polytechnic Institution*; and to which reference, if we mistake not, was made at the time in our columns.]

LOCOMOTION—THE RELATIVE ADVANTAGES OF STEAM AND ANIMAL POWER CONSIDERED.

TO THE EDITOR OF THE MINING JOURNAL.

SIR.—Permit me, through your medium, to offer to your readers and the public some observations on the relative merits of steam and animal power as applicable to locomotion.

Some time ago, I waited upon the secretary of the Greenwich Railway, for the purpose of soliciting an interview with the directors, relative to proposing to them a plan of conveying their traffic by animal power, by which I imagined that a considerable saving would be effected, and was pleased to find that the secretary entertained the same opinion as myself on the subject. I also, at the same time, had an interview with the engineer, who, although he did not admit the saving would be equal to my anticipation, yet thought the subject worth investigating, and intimated that the only way to arrive at facts, whereby to judge in the matter, was to learn what a responsible party would undertake to convey the passengers for, either per train or individually. The secretary very obligingly promised to lay before the directors any communication I might be disposed to make, I accordingly, some time after, addressed to them a long letter, in which I endeavoured to show that a saving of from 5000*l.* to 10,000*l.* per annum might be effected, by adopting horse-power; but as the receipt of the communication was never acknowledged, I am not aware if ever it was laid before them. Some time subsequent, I again addressed the directors, stating that I was authorised by a most respectable and responsible coach contractor to find the requisite number of horses, and convey their traffic (not exceeding sixty passengers each) at less than 1*s.* 6*d.* per train, the whole distance of three miles and three-quarters—little more than one farthing each, or about the sixteenth part of a penny per mile, being, according to my estimation, about 200 per cent. less than it now costs them for steam, &c.; but this communication, like the former, was never acknowledged; consequently, it may be presumed the subject was deemed not worth entertaining. However, whatever may be their, or others', opinion, I considered, and fearlessly assert, that horse railways would be (all things considered) a greater public convenience and advantage than steam. It cannot be disputed—at least, it cannot be disputed—that, from some cause or other, in order to obtain the average speed of twenty miles an hour, 15*l.* out of every 100*l.* (of gross taking) is expended beyond what would be required to maintain animal power to accomplish the same work, at half the speed; in fact, one half the sum expended on some railways for coke only would be more than sufficient to maintain the requisite animal power to convey the same amount of traffic.

I find that the cost of constructing five of the principal horse railways in America is under an average of 1000*l.* per mile. Mr. Telford estimated, in 1825, a horse railway from Glasgow to Berwick, and from Liverpool to Birmingham, at considerably under 5000*l.* per mile. I therefore cannot but think that it must have been a greater public benefit to expend, say even 5000*l.* per mile, to convey at ten or twelve miles per hour, than to expend 50,000*l.* to 60,000*l.* per mile to go twenty miles per hour, which is certainly all the advantage gained by steam railways; and I think it must be obvious to the diligent capacity that a road involving a rent, on account of outlay, of 250*l.* per mile, could better afford to charge a moderate fare than a road involving a rent of from 2000*l.* to 3000*l.* per mile—the former possessing more than all the advantages of the latter, excepting speed. The enormous outlay for steam railways is mainly occasioned by adopting the principle of adhesion, or friction, on the rail. I still incline to think that the plan I proposed thirty-four years ago (for which I entered a caveat at the Patent-office)—of fixing a cast or wrought-iron rack on longitudinal timber, on the middle of the way, between the rails, the carriages to be worked thereon, by manual or steam-power—would have been better than the principle of friction; because, by such means, comparatively steep ascents might be gained, and engines of two to three tons weight would be as effective as the ponderous road and rail destroying engines of fifteen to twenty-five tons each. I shall not be much surprised if the plan will not be some day adopted, though, perhaps, not in my time; and, by adopting such a plan, probably one-third, or one-half, of the expense of constructing the roads might be saved. It is even questionable with me whether, under peculiar circumstances, manual power may not be even better than horses or steam. I have often thought that, if five men at a windlass is equal to a horse, what is to prevent a light machine, worked by, say eight men, doing as much work as a horse, on a railway, and, as the men would not be affected by their own weight beyond about half a pound each, for friction, may it not be reasonably assumed that the men could go over eight times more ground than the horse—as the horse, at twelve miles per hour, could only do twelve miles, whereas the men could continue to exert themselves at the same speed for eight or ten hours a day, and thus accomplish about sixty-six miles in a day. Thus, owing to the peculiar formation of man, whereas speed is concerned, a man, by mechanical aid, can exceed the power of a horse, because the horse has not only to drag the load, but also to carry its own weight, which causes it to tire at the end of the first hour.

I feel quite confident that, in theory, I am correct; and, last week, on the Grand Junction Railway, I saw what I conceive to be a practical demonstration. H. Tate, Esq., contractor for keeping the rails and road in repair, has constructed a machine very similar to the plan I published in Ireland last year—only, instead of using a cog-wheel, he uses a band, whereby, as I conceive, he has not obtained all the advantage he might have done by using a cog-wheel. The machine does not weigh more than about 4 cwt., by which two men can, for a short time, convey it, themselves, and four men as passengers, at a speed of from twenty to twenty-five miles per hour; and, at half that speed, I have no doubt, they could carry three times that number. A little boy, not more than seven or eight years old, propelled the machine, from a state of rest to a speed of from three to four miles per hour, with myself and another person on it, weighing together, I imagine, not less than 7 cwt. Mr. Tate is clearly of opinion that when labour is cheap, and under peculiar circumstances, manual labour may be even cheaper than horses or steam, especially where speed is required. The machine alluded to was made to accommodate the workmen, &c., on the line, and Mr. T. informed me that, with two men, he has gone over fifteen miles of the line, stopping at twelve different points, within the hour.

It is well known that a horse, on a good railway, will draw at least fifty passengers at the rate of twelve miles per hour; assume, therefore, that eight men shall be equal to one good horse (allowing 20 or 25 per cent. for friction of machinery, &c.), we shall then still have a power equal to the horse), and, as that number exceeds the usual average number of each train on the Greenwich Railway, is there anything unreasonable to prevent six sets, or gangs, of men performing 112 trips per day—viz., every quarter of an hour each way, for fourteen hours; fifty persons each trip, or 5600 per day? and, if so, and while loaded men can be procured at 5*s.* per day, then manual power will be cheaper than horses or steam, as this would only amount to about 1*s.* per trip, or about one farthing each for the whole distance of nearly four miles, or less than the sixteenth of a penny per mile!

There are several reasons to account for the economy in constructing horse railways. First, it is not necessary to have such very easy gradients, and, therefore, it does not require so much cutting and embanking; secondly, the track and iron required need not be more than one-fourth the substance necessary for a steam railway, and the difference in cost of working is from two to five per cent. The average cost of working steam railways, including maintenance of way, is upwards of 2*l.* out of every 100*l.* of gross income; whereas the same amount of work could be accomplished by animal power at not exceeding one-fifth that amount, to convey it at half the speed; consequently, if the public would be content to go at the speed of ten to twelve miles per hour, they would save at the rate of 1*s.* out of every twenty, and, I think, by far the largest portion of the public would prefer the economy of money to the economy of time. Another great advantage of horse railways is, that they can be constructed on the sides of turnpike roads, because, being worked by labour, there would be nothing to apprehend by way of obstruction or inconvenience to the public. As far as I have seen of the surface and

roads in this country, I am persuaded it is safe to estimate the cost of construction, including general contingencies, to obtain as good gradients as on many steam railways, would not exceed from 1500*l.* to 2000*l.* per mile; that the cost of working such railways would not exceed 50 per cent. of the gross takings, including every expense except interest of capital; and that on such railways one good horse would convey, twelve or fourteen miles per day, at least thirty passengers, at the speed of ten to twelve miles per hour, and eight to ten tons of goods at from three to four miles per hour, at a charge—for passengers, say maximum 1*d.* and 1½*d.* per mile, and goods at 1½*d.* to 2*d.* per mile per ton. The reason for the great economy may be readily imagined, when it is considered that, whatever weight one horse will draw on any macadamised road, lay down an iron rail on its side, with the same undulation, and the same horse will do from six to eight times more work.

It should be observed that the proposed railway, if conducted along the side of a turnpike road, must be constructed and managed similar to other railways, and be held and preserved as private property, belonging in like manner to a company; and, to render a double line unnecessary, turn-out, and stations, stables, &c., should be provided, at every six or seven miles, by which means (if requisite) communication from end to end, and throughout the line, might be kept up every forty-five minutes; and a labourer, or workman, should be stationed on every mile of road, to guard, to do the needful repair, and to keep the rails clean and in good condition, and to remove or prevent obstructions which might otherwise occur; thus, by systematic arrangements, great regularity of movement might be attained. It would be a still greater advantage and convenience to the public if a cottage was built for workmen employed in attending each mile of the road, because these cottages would be stations, where goods or passengers might be taken up or put down—thus obviously increasing the value of all the land through which the line passes, on account of the convenience of transit of goods from the land to the mile stations. In conclusion, allow me to state, in a debitor and creditor manner, the advantages and disadvantages of a horse railway:—

Advantages.—1. The cheapness of construction, being about from one-sixth to one-tenth the usual cost of steam railways. 2. Convenience to the public located near or on the road. 3. Greater safety, ease, and comfort, in travelling. 4. Preserving and improving the value of property contiguous to the line. 5. When constructed on the side of a turnpike road, paying a sum to the trustees equal to the toll of the coach, &c., traffic; thus saving the wear of the road. 6. Great economy in the charges—averaging about 1*d.* per mile for passengers, and 2*d.* per ton per mile for goods.

Disadvantages.—Travelling at half the speed—viz., ten miles instead of twenty miles an hour.

Where the line is required to pass over valleys, and there be ascending and descending hills within half a mile of each summit, I propose to improve the gradient by means of a strong timber viaduct, including the expense of which, I am persuaded, the cost, in no case, on an average, would exceed 1000*l.* per mile. Following the surface of the road, the cost would not exceed 1000*l.* per mile. These viaducts would not, like solid embankments, injure or disfigure the land over which they might have to pass.

There cannot be a doubt but that, for what may be termed minor or short lines, especially into agricultural districts, that horse railways will be found by far the most convenient and accommodating, independent of the great saving in original cost and the expense of working.

Bristol, March 14. THOMAS MOTLEY, C.E.

LARGE CASTINGS.

TO THE EDITOR OF THE MERTHYR GUARDIAN.

SIR.—Some three or four weeks ago my attention was drawn to a paragraph in your paper, giving an account of an extraordinary large bar of iron, which was made at the Down's Iron Works. Perhaps it would not be amiss to inform such of your readers, who feel interested in the manufacture of bar-iron, of the manner in which that bar was made. The pile, weighing about 3000*l.*, after being sufficiently heated, was taken to the hammer and shaped into a bloom; it was reheated, and drawn a second time under the hammer, after which it was again heated (for the third time), and worked in the rolls to a round bar, eight inches in diameter, and about fourteen feet long, and, I am sorry to say, its appearance is far from being so good as what the reporter of that paragraph represents it to be.

On Saturday last a very large cable bolt was made at the Cyfarthfa Iron Works, and, for the sake of comparison, I will also state the manner in which that bar was made, and leave it to the judgment of your readers to say which of the two was the most difficult to roll. The pile, weighing about 25 cwt., was, after being properly heated, taken out of the heating furnace and put at once into the rolls, and, in the short space of twenty minutes, came out a perfect bar, about six and a half inches diameter, nearly twenty-seven feet in length, and as "straight as a line."—Knowing the unenviable notoriety that the Down's folks have obtained for "throwing the sledge," I feel a little diffidence in drawing this comparison—consequently, I have thought it better to confine myself to facts, and to let your readers draw their own conclusions. Trefis Well, Feb. 28. AN OLD ROLLER.

MINING CORRESPONDENCE.

ENGLISH MINES.

HOLMBUSH MINING COMPANY.

March 13.—In the 110 fathom level, driving west of Wall's shaft, the lode is six inches wide, and worth about 7*l.* per fathom. In the 100 fathom level west the lode is fourteen inches wide, and worth 9*l.* per fathom; ditto, east of Wall's shaft, the ground is a little more favourable for driving—the lode is still small and poor; in the cross-cut, towards the Flagjack lode, the lode is not so favourable for driving; no lode has yet been taken down in the mine sinking under the 100 fathom level. The lode in the stopes, in the back of the 100 fathom level, is without alteration, since last reported—still worth about 30*l.* per fathom. The eighty and ninety fathom levels, west of Hitchin's shaft, are progressing towards the lode. In the back of the ninety fathom level the lode in the eastern stopes is twenty inches wide, and worth 35*l.* per fathom; in the middle stopes the lode is two feet wide, and worth 40*l.* per fathom; and in the western stopes the lode is two feet wide, and worth 50*l.* per fathom. In the eighty fathom level, east of Wall's shaft, the lode is one foot wide, composed of capel, spar, and mudstone. The ground in the cross-cut, towards the north lode, is still favourable for driving; the lode in the stopes, in the back of ditto, is sixteen inches wide, and worth 30*l.* per fathom. The lode in the seventy fathom level, west of Hitchin's shaft, is nine inches wide, producing stones of ore. In the sixty-two fathom level, both east and west, the lode is small and unproductive. In the drop adit east the lode is sixteen inches wide, composed chiefly of capel, with some spar and mudstone. The pitches are without important alteration.

UNITED HILLS MINING COMPANY.

March 14.—At the seventy fathom level, in the eastern end, the lode is four and a half feet wide, two and a half feet ore of good quality; in the western end the lode is three feet wide, producing some stones of ore. At the sixty fathom level, in the eastern end, the lode is five feet wide, producing some ore, with a kindly appearance; in the western end the lode is four and a half feet wide, very throughout, but of low quality. At the fifty fathom level the lode is three feet wide, and good ore. At James's shaft the lode is three feet wide, eighteen inches ore of good quality. At the forty fathom level the lode is two feet wide, producing but very little ore. At the adit west, at Wren's Sparrow, in the adit east, the lode is two feet wide, producing some good stones of ore. No lode broken in the twenty fathom level west.

N. LANGRISH. S. H. FRANKS.

CORNISHIAN MINING COMPANY.

March 13.—The seventy fathom level, west of engine-shaft, is favourable for driving; the lode is about two feet wide, composed of spar, mudstone, &c. In the sixty fathom level west the lode appears to be increasing in size, and has some promising indications of improvement. We calculated on having the west run of lode before now, but its inclination westward appears to be so rapid that it will nearly reach Marvey's shaft at the sixty fathom level. Marvey's shaft, sinking below the fifty fathom level, is producing some good stones of lead.

TREGOLLAN MINING COMPANY.

March 11.—At Christmas, at the eighty fathom level east, the lode is fifteen inches wide, a regular kindly lode, but not much ore. At the eighty west we have cut a branch, about eight inches wide, but it is not the main part of it. The seventy west is twenty inches wide, impregnated with ore. At the sixty west the lode is very large, and all saving work for ore. The fifty west is sometimes discovered, but is more kindly. At Good Fortune the fifty west is two feet wide, producing some good ore, and a kindly lode. The forty four west is eighteen inches wide, and not much ore. At the thirty-four west the lode is three feet wide, and a branch of ore on the south part will produce one ton per fathom.

CORNBROOK TREVILL MINING COMPANY.

March 12.—Hawwood's shaft is now down to the fifty fathom level. The lode in the forty fathom level, east of Hawwood's shaft, is one foot wide, very good brittle ground. The Blind Well's lode, at the adit level, west of Marvey's shaft, is fifteen inches wide, producing some good ore. The tin lode in the back of the adit level, east of Marvey's shaft, is much as last reported.

H. WILLIAMS. J. MORTIMER.

WREN'S SPARROW MINING ASSOCIATION.

March 12.—The ground in the eighty-five cross-cut and south is favourable for driving. The seventy east, on the north branch, is worth 10*l.* per fathom; ditto, on Wren's Sparrow lode, is worth 15*l.* per fathom—the stopes in the back of this level are worth 20*l.* per fathom; ditto west, has not been taken down. The south adit shaft, sinking below the seventy, is in favourable ground. The fifty-seven east, on Wren's Sparrow lode, has not been taken down. The forty-two east is worth 15*l.* per fathom. Our fallings are working vigorously, and the pitches look well.

S. LEAN.

TREGOLLAN MINING COMPANY.

March 13.—The lode, in extending the sixty-two fathom level east, is large, and composed of capel and spar, with a small quantity of black and grey ore. The lode going east, at the fifty fathom level, is also composed of capel and spar, with a small proportion of black and grey ore. We are at present excavating the lode from the south to the north part, at the forty fathom level east, where it is very large, and found to contain some black ore, with a kindly appearance. We have not yet stepped the bottom of the sixty-two fathom level sufficiently to enable me to report particulars thereon.

JAMES NINNIN.

FOREIGN MINES.

REAL DEL MONTE MINING COMPANY.

We last week gave an ample report of the highly satisfactory proceedings of the meeting of this company—the bright prospects detailed in the reports from the agents, we are happy to say, are fully corroborated in the elaborate statements read at the meeting. From the managers' report, we find that the Biscaina vein and Terrero shaft yielded returns to the amount of \$35,000 per month; the Santa Ynes vein, which crosses the Biscaina, \$4000; the Santa Brigida vein, in the mine of Sacramento, \$6600; Acosta, \$25,700; and the total produce had averaged \$71,700 per month. The improvement in the ley of the ores had been very satisfactory, and, upon the whole, the future prospects of the company were highly encouraging.

BOLANOS MINING COMPANY.

The following is an abstract of the managers' report, read to the proprietors at their meeting, held on the 8th inst., and referred to in our last:—The discoveries in the Barranco mine, which induced Mr. Flores to continue trials for a limited period, looked well for a time, but suddenly fell off in April, and in May last the works were suspended. For the period of six months, during which the trials were made, the loss was calculated at \$27,000, but the produce of silver from the ores being much greater than was anticipated, this amount will be materially lessened, if the cost is not entirely covered. Some new methods of concentration and reduction of the ores have been completely successful; they have been in regular operation since June, and the results have had considerable effect on the value of the returns; and a considerable quantity of ores, which were not before considered worth reducing, would now be worked up with profit. With respect to the northern mines, the directors had consented to certain operations, to a small monthly amount, but it had been found impossible to prosecute these operations effectually with the means proposed, and they were giving the matter their serious consideration, with a view to an advantageous determination of this important matter. About the month of June the company acquired a considerable addition of ground, through which the productive veins are known to pass, and the extent of this mining field thus includes, besides the mines of Melancho, San Clemente, and San Nicolas, those of Loreto, San Rafael, Santa Barbara, and Veta Bella—all these are adjacent, and are held in high estimation. Since the month of July, when the ley of the ores became so low as seriously to diminish the value of the returns, no material improvement had taken place, and the profits were low and fluctuating. From the advice received, since the beginning of February, San Nicolas, it appears, had given indications of improvement. The fluctuating character of the mines had long been known and ascertained; and, in the directors' time, there had been two periods of rapid profit, with one of considerable loss; these profitable periods enabled the company to relieve their affairs from the serious embarrassments of 1841, and was sufficient to discharge the weight of debts both in this country and Mexico.

IMPERIAL BRAZILIAN MINING ASSOCIATION.

Guape Soto, Dec. 31.—Since the date of our last we have obtained a little gold from the back of the forty-one fathom level, west of Curtis's, and a little from the twenty-one fathom level, east of Walker's, shafts. Vessy's engine has been working since the 28th inst. We commenced working in the fifty-two fathom level in the course of a few days. Our quarterly mining report, with sketches of the underground workings, will be prepared against the post of the 10th of next month. T. BLANVET. T. PENNILLERY. J. LUGG.

Jan. 3.—The mine continues poor, although a little gold has been obtained from the vein in the back of the forty-one fathom level, west of Curtis's, and a little also from the back of the twenty-one fathom level, east of Walker's.

I. K. A. CHIFFERT.

Rio Janeiro, Jan. 17.—The troupe of the Cata Branca Company arrived on the 13th inst., and brought us a remittance, on your account, from Guape Soto, according to the documents which accompanied it, of 110*l.* gold duty, which, less 2*l.* 3*s.* 16*d.*—2 per cent. export duty, we have enclosed in the *Ranger* packet, as per bill of lading we now beg to enclose.—The exchange closes at 265, firm. NAYLOR, HAYWARDS & CO.

Gold Report.		From stamps.		Total.	
		lbs. oz. dwt. gr.		lbs. oz. dwt. gr.	
December 25	.....	11 2 10 0		11 2 10 0	
" 26	.....	11 2 10 0		11 2 10 0	
" 27	.....	11 2 10 0		11 2 10 0	
" 28	.....	11 2 10 0		11 2 10 0	
" 29	.....	11 2 10 0		11 2 10 0	
" 30	.....	11 2 10 0		11 2 10 0	
" 31	.....	11 2 10 0		11 2 10 0	
Eight days	.....	11 2 10 0		11 2 10 0	
Total from 1st July to 31st Dec.	.....	110 2 10 0		110 2 10 0	

BRAZILIAN COMPANY.

Cata Branca, Dec. 30.—From various obstacles in the mine, the stamps have been very inefficiently supplied this week, but appearances in the bottom continue favourable.

Jan. 4.—The gold was sent to Rio yesterday, 120*l.* 5*s.* 6 dwt. 2 grs., being, exclusive of duty, the produce from 20th October to 31st December inclusive (arrived per *Ranger* packet).

Jan. 9.—In consequence of the number of hours short stamping, the gold return for the last few days is very unsatisfactory. W. T. GRIFFITHS.

Gold return for fourteen days, to 6th January, 27*l.* 5*s.* 3 dwt. 25 grs.—Ditto for the year 1842, 700*l.* 4*s.* 14 dwt. 30 grs.

ST. JOHN DEL REY MINING COMPANY.

Moran Yello, Jan. 6.—Produce for December, 2020*l.* 1*s.* 10 dwt. 1 gr. Try; 2014*l.* 6*s.* 10 dwt. 1 gr. per ton. The rise in the standard of ore stamped last month will, no doubt, be gratifying to you; the reason I have to assign for it is, we have stamped a good deal of good stone, and not so much kilas as usual. As to the future cost, I am quite confident that the expenditure will be reduced—in fact, is reduced, in the actual consumption of various articles, in over time of whites and blacks, and in consumption of materials. I doubt not of saving 3000*l.* per month.

Medical Report.—We have lost two blacks during the month; there is one case of small pox among our own blacks, and one among the free labourers; they have been removed to Bella Fama for treatment. Up to the present time we have kept very free from the disease, and, I trust, by keeping a careful watch over the blacks, we may continue to do so.

MINE ACCIDENTS.

Pennsylvania.—On the 25th inst., John Ford was killed in one of the levels, from a quantity of rubbish falling on him.

Great Work Mine.—On the 25th inst., William Kado was killed by the sudden exploding of a hole, which he was preparing for blasting.

Wood Far.—On the same day, W. Dunstan was also killed, by a hole he was preparing to blast, suddenly exploding.

STEAM-ENGINE.—Mr. R. Gory, in the House of Commons, on Wednesday evening, moved for "return of the names of marine engine makers with whom the Admiralty have made contracts for engines, from the year 1839 to 1842, inclusive, with the amount of horse-power ordered from each of such engine makers in each year; of the original cost of the engines of her Majesty's steam vessels *Arcton*, *Donatelson*, *Glebe*, *Cyclone*, *Franchette*, *Polypheme*, *Frederic*, and *Strandhill*; specifying any extra charge beyond contract price, and if such engines were fitted with an indicator; of repairs, and the cost of such repairs, and the number of days and hours any of the said vessels were incapable of performing their work in consequence of such repairs; and of the names of the makers of each of the engines of the said vessels." We shall anxiously look forward to the production of the returns ordered, as, doubtless, much valuable information will be obtained therefrom, in connection with the relative merits of the different engines. We have heard several rumours as to the object of Mr. Gory's motion, but, under present circumstances, we think it desirable to await their publication, when we shall make some observations thereon.

THE SERIAL STEAM-CARRIAGE.—Our readers will, doubtless, recollect the statement we some time ago made respecting a company which was forming to carry out an invention of an aerial steam-vehicle. At the time we made no assertions further than relating the facts, and we did not venture to speculate on the chances of success which attended this seemingly Utopian enterprise. The plans of the inventors, we, however, now further developed, and, by glancing at the petitions presented in Parliament last week, it will be seen that Mr. Leimonson begged leave to bring in a bill to enable the Serial Company to purchase the patent right from Henson and Co. This we have given the title of our former account; and to further assist the fact which we then made known, we believe we shall be enabled, at the end of the present month, to furnish not only an account of the enterprise, but illustrations also of the machine in its progress through the air; its interior, and its general form and structure. We say we believe we shall be enabled to accomplish this, because we wish to avoid plunging ourselves to length into a controversy with the inventors of others, or to phenomenally declare that which should be kept secret; but still, our present belief is, that we shall be able to fulfil our promise respecting this most extraordinary invention.

